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A NEW COMPLETE RANGE OF SPLINTS AND FRACTURE-REDUCING APPARATUS DESIGNED ON THE "UNIVERSAL" PRINCIPLE.

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THE three splint frames and stirrup which comprise this series were demonstrated at the clinical meeting of the New South Wales Branch of the British Medical Association at Sydney Hospital on October 22, 1936, together with the methods of reducing fracture deformities of forearm and cervical spine.

GENERAL CONSIDERATIONS.

The original object of these splint frames and stirrup was to make it financially practicable for every practitioner to possess, packed within the limits of a suitcase, the means of first reducing and then retaining and treating any difficult complicated or compound fracture that he is likely to meet.

The simplest effective method of reduction and treatment is always best. But the increase in occupational and automobile fractures in adults and the enormous increase in compensation claims and litigation arising from their sequelæ have taught that methods of proven value in the simpler fractures need amplification and modification to secure perfect results in major cases. The principal lines along which modern development has proceeded have been in the provision of: (*a*) traction frames for the reduction in otherwise difficult cases by screw traction, acting through hooks, pins, wire or adhesive, variously attached to the limb; (*b*) splints and "Balkan frames" or gallows for continuous traction after reduction; (*c*) devices for permitting active movement of all joints other than the immobilized one; (*d*) devices for treating stiffness of joints and contractures of connecting tissues after union of the fractures.

The principles, and to a less degree the methods, by which these objects are attained have become fairly standardized amongst surgeons

specializing in fractures. But for the general surgeon and the practitioner dealing with the occasional difficult case a practical bar to the use of the ideal apparatus or method is met with in the present multiplicity and cost of apparatus. Traction

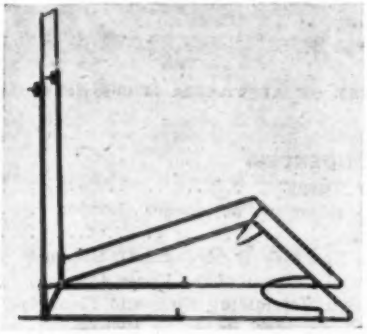

FIGURE I.

The universal splint frame, without accessories, set up for nursing the limb of a child and for different positions of hip, knee and ankle. (The foot suspension hoop is not shown.)

frames are cumbersome and expensive, and separate frames are needed for thigh, leg and arm. Hooks, pins or wire may be variously needed for best results, and each means a separate stirrup. Indeed, varying sizes of stirrup or hook will be needed for different parts of the limbs. Splints for reducing stiffness of joints, adhesions, and contractures, by spring or by turnbuckle, are normally built to the limb of the individual patient, to be discarded later after much expense (if, indeed, the patient can afford them at all). Attempts have been made in

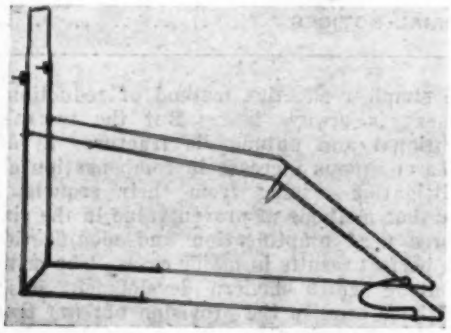

FIGURE II.

The universal splint frame, without accessories, set up for nursing a patient seven feet in height.

many forms of retentive splinting to allow the vital principle of active movement throughout of all joints other than the immobilized one. It is hoped to demonstrate, in discussing the separate splints, that this ideal has been more completely realized in this than in other forms of splinting.

As regards expense, it is fairly safe to say that very few, if any, practitioners or even surgeons in specialist fracture practices possess in advance the complete range of splints and frames for either side or limb of any patient from school age upwards required to subserve the eight functions enumerated below. Should he possess such an armamentarium, it is also safe to say that the cost must have been counted in hundreds of pounds. The universal splint frame alone, with all its accessories (Figures I to XXVII), costs less than £A20 (apart from the pelvic rest and abduction frame required to turn it to the uses of an orthopædic table) and may not only be used to reduce any fracture of either limb apart from the hand, but may then be used to nurse in suspension the same fractures, or to reduce by continuous traction any limitation of movement in the same regions. The clavicle-to-elbow splint frame (Figures XXVIII to XXXVI) attains the same ideals for the ambulatory treatment of injuries from the clavicle to the elbow joint, and the hand splint for the metacarpals and phalanges.

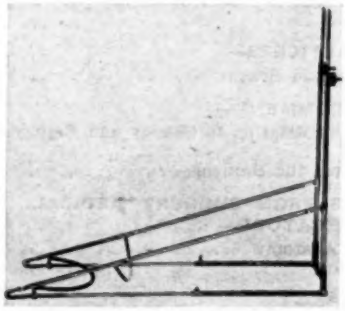

FIGURE III.

The universal splint frame, without accessories, set up for nursing a fractured patella.

A reservation must be made here, that in my opinion fractures of the femoral neck are in many cases better treated by the Smith-Petersen pin, but the universal frame *plus* a pelvic rest (Figure XXIV) and any form of support for the trunk and head suffice for this operation.

All the apparatus shown is easily taken apart and can all be packed into a 26-inch suitcase. This feature is of great help when a surgeon is suddenly called to a country town, or a practitioner to an outlying home. A further advantage lies in the ease of sterilization and also of storage.

It is the object, then, of this article to describe three splint frames (universal, clavicle-to-elbow, and hand) and a stirrup (Figures XLVI to XLIX) that I have designed and which it is hoped will justify the term "universal". By that is meant that, with the aid of ordinary tradesmen's tools and the materials for plaster fixation: (i) any or all of the eight functions enumerated below may be served on (ii) either side in (iii) a fracture or contracture of any part of either limb in patients of (iv) any age or height from school age upwards.

It is proposed to deal with these under the following headings: (*a*) eight functions of splinting:

(*b*) five practical ideals in splint construction; (*c*) description of apparatus, its construction and application; (*d*) descriptions of new methods for the reduction of fracture dislocations of the cervical spine and of the forearm, and of transport for fractures of the lower limb without disturbance of continuous traction, using the universal splint frame in each case; (*e*) corresponding methods for the hand with the hand frame, and for the remainder of the upper limb with the clavicle-to-elbow frame.

Eight Functions of Splinting.

In the address delivered at the British Medical Association meeting of October 29, 1936, I have given reasons why all retentive splinting should conform to the following ideals:

1. Anatomically correct retention of fragments.

2. Retention in the "position of relaxation" of as many joints of the limb as possible, consistent with complications and difficulties in retention.

3. The position of greatest circulatory ease for the whole limb.

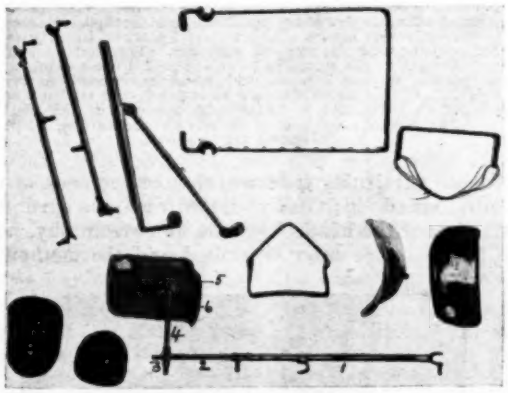

Figure IV.

Accessories to the universal splint frame. Above, from left to right: 1, two adjustable struts; 2, perineal post (Figures XVIII, XXIV, XXV and XXVII); 3, hoop for foot suspension; 4, tractor for toes (Figure XIV). Below, from left to right: 1, two saddles for lateral pressure under latex rubber over an angulation; 2, "adjustable hand"; 3, sole stirrup; 4, shoulder supports.

4. Relaxation of muscles attached to short fragments.

5. Nutritional exercise of the immobilized part, automatically attained by early active movement of every joint in the limb not included in the immobilized area.

In addition to retention splints, others, such as reduction splints, Balkan frames, traction frames and pulley machines, have been devised by many surgeons to subserve the following further functions:

6. Mechanical reduction of the more difficult comminuted and compound fractures by wire, pin or hook attached to winding gear.

7. Early active movement of the affected joints, released from the action of gravity, but still supported by splinting.

8. Continuous spring or weight traction, short of pain, for the reduction of adhesions and contractures.

Five Ideals in Splint Construction.

At present most splints are made in set sizes and for one side, while many have to be made for

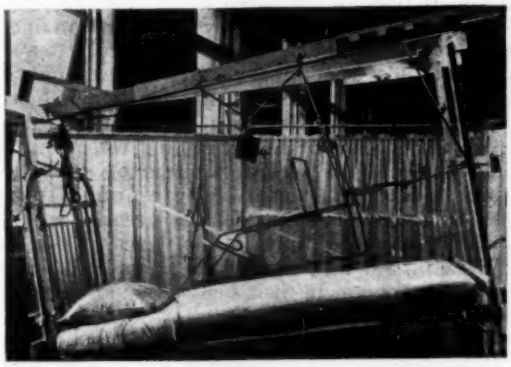

Figure V.

Nursing a lower limb, suspended, with continuous traction by Corlette's method, adapted to the universal splint. Corlette's gallows and universal splint to show details. 1, 2, 3 and 4 indicate snap-hooks, snatchblock type of pulley, guy-rope type of adjustment, and weight suspending the limb and splint. 5 indicates the self-retaining, multiplying pulley block, at present out of the way at the bed-head, for raising the body for nursing purposes.

the individual. This involves expense and a delay which may be detrimental to the patient. The following ideals are therefore enunciated for a universal splint.

It should: (i) serve all or as many as possible

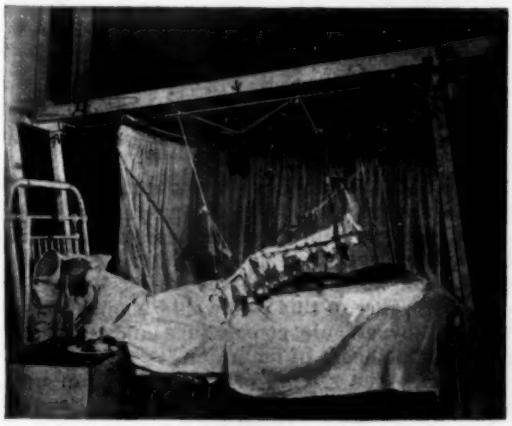

Figure VI.

Nursing a lower limb, suspended, with continuous traction by Corlette's method, adapted to the universal splint. First stage of treatment. Traction by the "adjustable hooks" from the condyles. Light traction on leg still to be applied (compare Figure X). Arrows indicate traction cord to twenty-pound weight at head of bed.

of the eight functions of splinting; (ii) be adaptable for either side; (iii) be adjustable for size; (iv) be easily portable and stored in small space; (v) be capable of being sterilized.

THREE ESPECIAL POINTS.

Although they are not directly concerned in the description of new apparatus, I cannot resist the temptation in any article on fractures to emphasize three points which I regard as of the utmost importance.

1. *Immediate Elevation of the Limb.*—A plea is here made that all fractured limbs shall be treated in the position of circulatory ease (a centripedal downslope) from the moment the medical attendant has made his preliminary physical examination, without waiting for X ray examination, reduction *et cetera*. Such position greatly minimizes œdema, facilitates subsequent reduction and retention, and tends to avoid the serious sequelæ of circulatory embarrassment by œdema or by continued oozing from fractured surfaces, besides greatly reducing pain and therefore shock. Observance of this rule by the first-aid and ambulance attendants should be a cardinal point in their instruction and practice.

FIGURE VII.

Nursing a lower limb, suspended, with continuous traction by Corlette's method, adapted to the universal splint. Later stage of treatment. Knee and ankle joints released and knee being exercised.

2. *Pain.*—A limb properly set and retained by any adequate method is really genuinely comfortable. If there is pain requiring more than a simple sedative for sleep, there is something wrong, which must be diagnosed and corrected. I believe that strict observance of this rule would abolish pressure sores and hyperæmic contracture and enormously reduce the incidence of malunion.

3. *Speed.*—The setting of fractures is an urgent operation. Œdema should never be allowed to become gross. With elevation of the limb from the time it is seen by the first-aid attendant, with local anæsthesia when it is preferred or when general anæsthesia is not immediately available, and with the universal availability of mechanical traction, made possible by the frames described here, any fracture, no matter how difficult, should have a reasonable chance of accurate reduction and retention within one to six hours. Delay means muscle spasm, pain, shock, œdema, abnormal pressure on tissue or bone, hæmorrhage and hyperæmia, each definitely adding its quota to difficulty of reduction and retention and to devitalizing of tissue, contributing to malunion, delayed union, stiffness and prolonged disabilities.

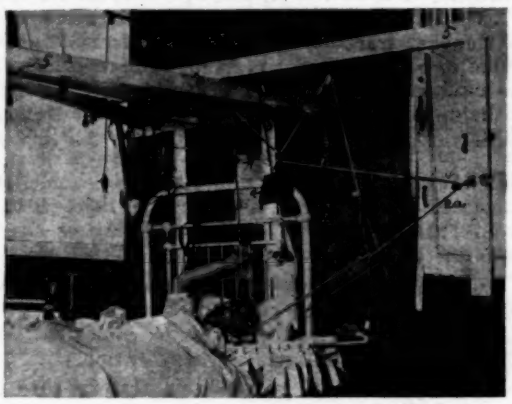

FIGURE VIII.

Nursing a fracture dislocation at the shoulder, suspended, with continuous traction, by Corlette's method, adapted to the universal splint. Traction cord marked by arrows. No hoop around the arm at shoulder. Traction on arm by adhesive to the uprights of the splint. Free movement of patient in bed. Limb and splint suspended as for thigh. 1, 1a: adhesive traction to arm; 2, 2a: traction to weight at bed-head; 3, 3a: weight suspending forearm; 4, 4, 4: weight suspending splint and contained limb; 5: Corlette's arm gallows.

In one particular fracture, that of the neck of the femur, speed is vitally important to save the nutrition of the head. There is no reason why, with the splint frame later described and the method of

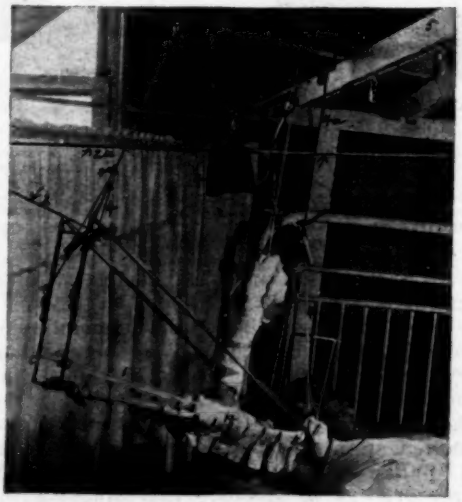

FIGURE IX.

Another view of splint adjustment shown in Figure VIII.

transport outlined, such cases should not be at once put up in the home if transport is likely to be long or delayed, or in the casualty room if a Balkan frame is not available in the ward. I believe that

an unrealized proportion of bad results in spite of good treatment later is due to this factor.

PHOTOGRAPHS.

Photographs are shown illustrating the various methods of use of these splints.

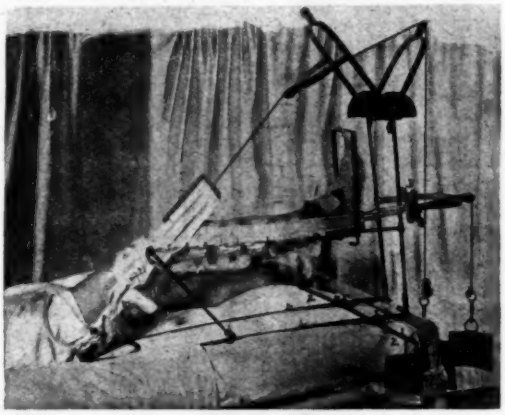

FIGURE X.

Nursing fracture of upper third of femoral shaft, late stage, traction by adhesive, fifteen pounds to thigh, five pounds to leg, without suspension. Foot of bed raised. 1 and 3: "Dunlopillo" latex rubber padding to malleoli and spreader. 2: Adjustable hand, fixed to bed frame by adhesive and holding padded left foot in abduction.

When possible, the plan has been adopted of placing only a skeleton in the splint without padding, as thereby details of the splint are not obscured by the limb, and in addition the method of action of pins or wire and stirrup is clearer.

For traction reduction of the forearm the limb has been used in order to illustrate the method of applying adhesive to the fingers and thumb for pin traction.

PADDING.

In all cases free padding on pressure points under metal splints is to be assumed. Where padding has

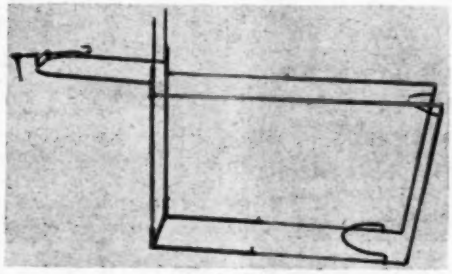

FIGURE XI.

Universal splint frame set up for reduction by screw traction of fractures of the leg and ankle.

been shown, it is usually of strips of "Latex" rubber of various thicknesses, which possess many advantages over the usual cotton wool and bandage: (i) they are quickly, easily and accurately applied; (ii) they are foolproof for uniformity of pressure; (iii) they are light and cool, being cellular throughout; (iv) they are economical, being cheap, sterilizable, capable of repeated use, and obtainable in sheets of any needed thickness; (v) they minimize the tendency of splints or bands to shift; (vi) they are neat in appearance and effect, and cleanly, appealing to patients who are particular as to personal hygiene, and allowing of washing the body freely.

RETENTION BY PLASTER OF PARIS.

Whenever plaster of Paris is mentioned, application of plaster direct to the skin, except to a very few special pressure points, is assumed (Figure XVI). This method should not be used without practical training or earnest study of a booklet devoted to the subject. The use of "slabs" and not of the rolled bandage, except to "finish" the plaster, is strongly recommended, both for simplicity and for safety. Cotton wool under plaster of Paris renders

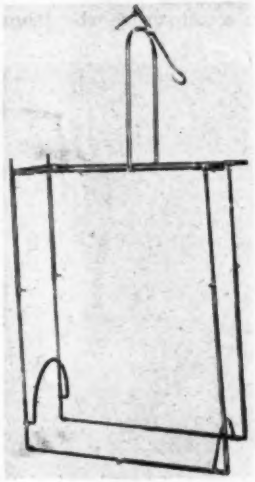

FIGURE XII.

Universal splint frame set up for reduction by screw traction of fractures of the forearm and foot.

it practically useless. For severe fractures extending into a joint plaster fixation may be effective only after several weeks of traction in suspension (*vide infra*).

METHODS OF NURSING IN SUSPENSION.

Whenever a limb is to be nursed suspended in one of the splints which I have devised, the methods described by Dr. C. E. Corlette in *The Journal of the College of Surgeons of Australasia* for March, 1930, are assumed.[1] If possible, a copy of his articles should be in the hands of every practitioner who treats fractures. Although good results can be, and are, obtained by nursing in splints of the Braun-Böhler (Figure X) and Hodgen type, I have never anywhere in the world seen patients so really genuinely comfortable, so free in their movements, and so easily nursed, as by the methods described

[1] See also THE MEDICAL JOURNAL OF AUSTRALIA, July 16, 1927.

and taught by Dr. Corlette and used as a routine at Sydney Hospital.

My splint frames have been consciously devised to bring within the reach of the practitioner the methods of reduction advocated by Watson-Jones, of treatment of the remainder of the limb taught by Böhler, and of nursing in suspension imbibed by me as a resident and junior surgeon from Corlette.

The Universal Splint Frame: Plan and General Construction.

The universal splint frame consists essentially of parallel steel rods, sliding within steel tubes, to support the thigh and leg by means of attached bandages or webbing.

There are joints, movable in a vertical plane, corresponding to the ankle, knee and hip joints of the patient.

By sliding the rods within the tubes and then fixing them by a set-screw, the lengths of leg and

Figure XIII.

Reducing a fracture of both bones of forearm with shortening. The same method is applicable to dislocations at the carpus. (Compare Figures XLIII, XLIV and XLV.)

thigh on the splint can be made to correspond with those of the patient (Figures I, II and III). The positions of ankle, knee and hip joints on splint and patient are thereby made to correspond, so that any joint of the limb still bandaged on the splint can be moved as desired.

Longitudinal stability is attained by a right-angled base extending from hip to ankle joint, both arms of the base being adjustable in regard to length. The leg and thigh pieces may be fixed to the base at any point by twin struts (Figures IV, V and X), also adjustable for length.

Lateral stability is maintained by the fixed right angles of the uprights, joined above by a removable loop. For nursing the lower limb without suspension this may be reinforced by attaching my "adjustable hand" (Figures IV, X and XXVI) and either laying it flat on the bed or clamping it to the side of the bed frame.

By relaxing the set-screws the frame and all its attachments come apart like a "Meccano" set. It can thus be quickly dismantled and packed in a

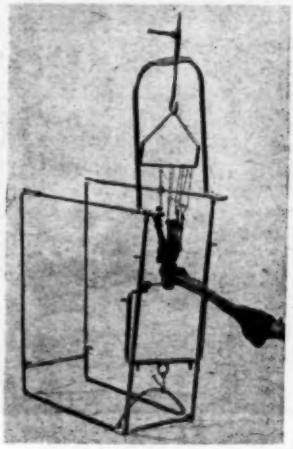

Figure XIV.

Illustrating method of reducing fractures with deformity of tarsus or metatarsus. Traction by overhead screw through stirrup, holding wires to toes with spreaders. Countertraction by Steinmann's pin and "universal stirrup" attached to the cross-loop of the frame.

suitcase so that it is easily portable, easily stored and easily sterilized. Further, any individual part can be quickly replaced by the local blacksmith.

Adjustment for size of the patient is made by adjusting the length of thigh and leg sections and correspondingly altering the length of the base (Figures I and II).

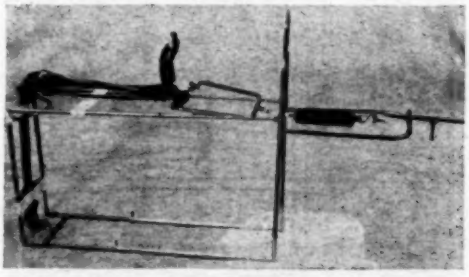

Figure XV.

Reduction of comminuted fracture of tibia and fibula at ankle joint. In many cases two weeks' continuous traction before application of plaster would be advisable.

Relaxation of muscles attached to short fragments can be attained by varying the angles of flexion at the joints (Figures I, II and III). Full extension of the knee can be so provided for patellar injuries (Figure III).

Anatomically correct retention is attained, as in Hodgen's or Braun's method, by flexion of the joints, elevation of the foot of the bed, weight traction against gravity, and adjustable pressure pads

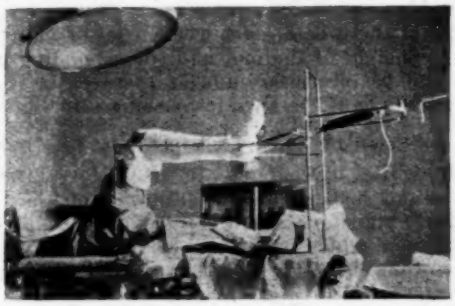

FIGURE XVI.

Reduction of comminuted fracture of tibia and fibula at ankle joint. In many cases two weeks' continuous traction before application of plaster would be advisable.

carried on a removable hoop (Figure IV) (for defects of lateral alignment not otherwise remediable).

Methods of Use.

This splint may:

1. Be used slung from a Balkan frame in the same manner as a Corlette's or Hodgen's splint (Figures V to VII) or may rest on the bed in the same manner as a Braun-Böhler splint (Figures X and XXVI).

2. Be slung from a transversely placed gallows as an abduction-continuous extension splint for arm

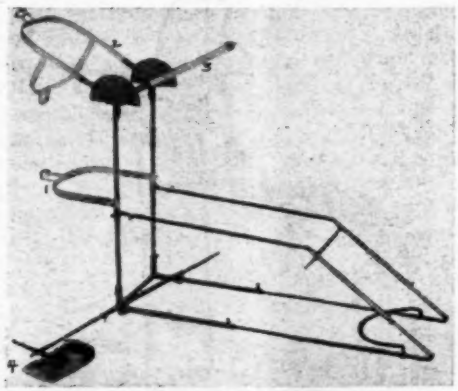

FIGURE XVII.

Universal splint frame set up with: 1, pulley-hoop for traction on leg; 2 and 3, large and small pulley-hoops for traction on femur or counterbalancing leg in exercise or lifting it in mobilization (Figure XIX) or countertraction in reducing splintered *os calcis* (Figure XX). The smaller hoop is attached to the inner sides of the slotted disk, by which hoops are fixed in varying positions by set-screw. It can therefore pass beneath the larger hoop. 4, "adjustable hand".

and forearm (Figures VIII and IX) in the same manner as a Corlette's arm splint.

3. Have a hoop and pulley (Figure XVII, 1) attached for continuous traction of the leg or thigh (Figure XXVI).

4. Be fixed as a rectangular frame and have a screw traction hoop added (Figures XI and XII), so converting it into a traction reduction frame for wrist, forearm, leg, foot or ankle fractures and dislocations (Figures XIII to XVI).

5. Have overhead hoops with pulleys added. This enables its use without suspension for continuous traction of the femur (Figures X and XXVI) or as a traction reduction frame for fractures of the femur in flexion (Figure XVIII) or for comminuted *os calcis* fractures (Figure XX). One may reduce the fracture and leave it on the frame, as in the Braun-Böhler method, order a Corlette's or other Balkan frame (if one is not ready) and then transfer the attachments to the gallows later without undue disturbance of the patient. If expense is a consideration, the whole course of nursing may be completed as in the Braun-Böhler method, with the advantages of adjustability and mobility, when desired, of any joint.

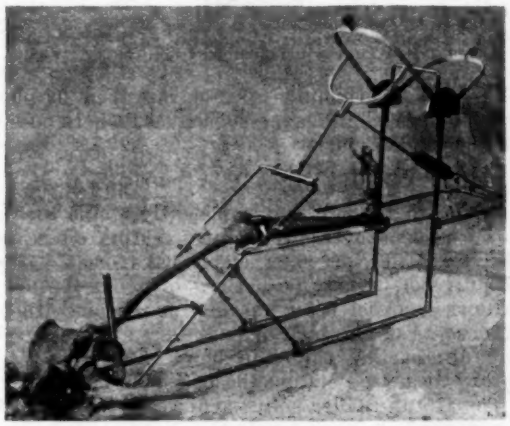

FIGURE XVIII.

Method of screw traction on thigh in flexion, as used for open operation on femur or for rough travelling in continous extension while on stretcher. (Compare Figures XXVII and XXVIII.)

6. Have shoulder-pieces attached (Figure IV) so that it will be converted into a frame for traction reduction of fracture dislocations of the neck (Figure XXI).

7. Have an "adjustable hand" attached, which I have designed for it, so that it is converted to use as a reduction frame for shoulder, arm and elbow (Figure XXII).

8. By adding a weight over a pulley, either suspended from the Balkan frame or incorporated in the splint, it may be used for continuous reduction of stiffness or contracture of hip or knee joints (Figure XIX).

9. By using the foot suspension loop (which is also perforated to hold shoulders for correction of lateral deviation of fragments) with a turnbuckle and spring, it may be used for continuous reduction of stiffness or contractures of foot or ankle joints, either flexor or extensor (Figure XXIII).

10. By adding a pelvic rest with abduction for the sound limb, it may be used for the insertion of a Smith-Petersen pin or for the other uses of an orthopædic table (Figures XXIV and XXV).

11. When set up as a traction frame for any part, it can be used to obtain and maintain length and alignment of bony parts during open operations.

Instead of describing each of these functions in detail, I have attempted to illustrate them by photographs, the skeleton being substituted where possible for the sake of clarity.

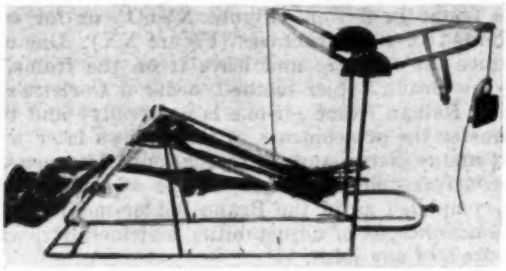

FIGURE XIX.

Method of exercising knee, or flexing an extended stiff knee (small counterbalancing weight only) or extending a stiff flexed knee without subluxation (heavy weight).

Use for Nursing a Lower Limb Without a Gallows.

Although the splint is sufficiently stable in itself to be used as a traction frame resting on a table (Figure XVI), or when suspended from a gallows (Figure V), it may be desired to avoid the use of gallows suspension for nursing for reasons either of expense or of the lack of necessary skilled nursing for adjustment. The splint may be used as a temporary measure pending the provision of a gallows.

The Braun-Böhler splint achieves this, but on the household bed or even some hospital beds it is found to be unstable laterally and is not adjustable for size or for angle at hip and knee.

With this frame no further apparatus is necessary to reinforce lateral stability when used on an uneven bed, as stability is obtainable by the "adjustable hand" (*quod vide*) provided with the frame. This can be clamped on the base and the hand can be placed flat on the bed anywhere (Figure XVII), irrespective of the contours of the bed; alternatively it may be placed flat against the outside of the bed frame and held there (Figure X), so holding the splint frame immovable relative to the bed frame. It can be removed by loosening a set-screw, allowing change of linen *et cetera*.

The method of making the bandage to support the limb on the frame has been fully described by Corlette and is applicable to all wire splints. Briefly the essential is that it be made in three parts, two lateral strips cut on the square to pin onto the frame, and a central one (cut on the bias) for contact with the limb. This eliminates the distress to the patient of uneven pressure. It will be found practically helpful to store the safety pins by sticking them deep into a jar of soft soap.

To provide the pulley traction on the frame an attachment is provided (Figure XVII, 2 and 3) incorporating Böhler's idea, but the arms are made adjustable to any angle (Figures XIX, XX and XXVII).

Should there be a solid wooden lower end to the bed, the height of the foot and corresponding pulley loop can be increased sufficiently to clear it without the angle of the knee joint being altered.

Use for Nursing a Lower Limb Suspended by a Gallows.

The splint is complete in itself for nursing a lower limb suspended by a gallows, and the photographs (Figures V to VII) sufficiently illustrate the method, which is directly copied from Corlette's description in *The Journal of the College of Surgeons of Australasia*.

For continuous traction on the thigh or leg this method has a great many advantages, both to the patient and to the nurse, over any other method.

There is no special feature in the details of the nursing with this splint as distinct from those with the Hodgen or Corlette splint, except that: (i) The length of the uprights at the foot prevents any tendency to lateral rotation of the splint (Figure VII). (ii) Without alteration of the bandaging, active exercise of the knee is possible by loosening the knee and ankle joints of the splint while the hip joint remains fixed. The foot of the splint is prevented from rising when the leg is lifted by a cord across the base of the frame and a small strip of adhesive over the pulleys which suspend the frame. At first, help may be afforded by a cord attached to the splint at the ankle and worked over a pulley by the patient's hand. Abduction is maintained by

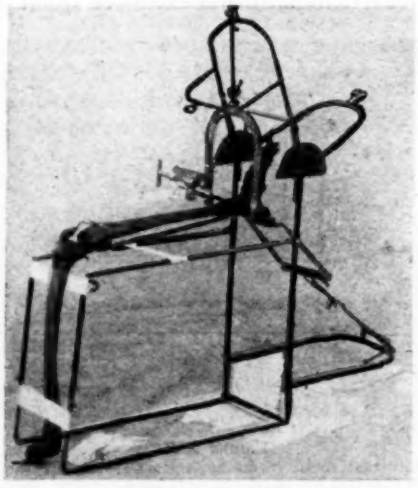

FIGURE XX.

Method of reducing comminuted *os calcis* with loss of its arch. Traction by screw downwards and backwards from pin in *os calcis*, counter-traction forwards and slightly upwards (proximally) from pin in tibia and fibula. The pins may be left incorporated in the plaster while the patient walks with a heel-iron.

slinging the sound limb in a second splint or in a Corlette splint, or less efficiently and comfortably by loose attachment to the bed frame.

Use for Nursing an Upper Limb Suspended by a Gallows.

Figures VIII and IX illustrate the method by which continuous traction is attained on both arm

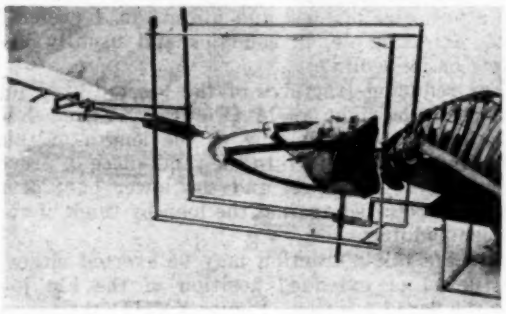

FIGURE XXI.
Method of reducing fracture dislocation of the neck.

and forearm with the use of a gallows transverse to the bed. The splint presents no advantage over that devised by Dr. Corlette, which is simpler and cheaper, except that: (i) Possessing this splint frame, the practitioner has it available at once and can substitute the simple Corlette frame should he need his splint frame for any other of its many uses. (ii) He can proceed directly from mechanical reduction in a difficult case to nursing in the same frame. (iii) The splint can be shortened to half length if the elbow is elevated. (iv) An influence can be exerted on the angulation of a mid-humeral fracture by taking the traction cord from the inner or outer hoops or from the base.

The method of suspension is directly copied from that taught by Corlette, which avoids all the drawbacks of pressure and interference with X ray examination by a metal hoop at the shoulder, and allows free movement in bed by the patient without disturbance of the fracture line. The gallows figured is also Corlette's, and especial attention is drawn to his recommendation of the snatch-block type of pulley for ease of attachment.

Use for Mobilization of Contractures and Adhesions.

(*a*) ***Underlying Principle of Method.***—The principle underlying all the methods described for mobilization of stiffness is that there shall be continuous mobile traction, not from a fixed point, but from either a spring or a suspended weight. The amount of pull is thus constant, unaffected by improvement in position, and is adjustable by the patient to comfort. Active exercise throughout the full range obtained is at all times possible, is welcomed by the patient, and is an essential part of the treatment.

(*b*) ***Mobilization for the Upper Limb.***—Its principal use for mobilization will be found to be for the lower limb (hip, knee or ankle), as the same object can be attained by the clavicle-to-elbow splint frame for shoulder and elbow by ambulatory methods (*quod vide*). If the splint is required for such a purpose with the patient in bed, the upper limb is suspended as described for the nursing of fractures in continuous extension. For the elbow the effect is attained either by gravity (lessening the suspension weight), if gravity aids the movement required, or by turnbuckle and spring, as described for the clavicle-to-elbow splint frame (*quod vide*). For the shoulder the effect is attained by altering the line of the suspending frame gradually from the transverse position towards the head of the bed, the length of the extending cord beyond the splint providing the elastic resistance of a swing regulated by the weight. When mobilization is required in the lower limb, it is placed in the splint as described for nursing without suspension, provided there is no subluxation. For contractures with subluxation preliminary continuous traction is advisable in the line of the limb.

(*c*) ***Use for Early Active Movement.***—Early active movement of the affected joint, released from gravity, is attained by attaching to the splint below the affected joint (at the knee for the hip joint or at the ankle for the knee joint) a balancing weight over a pulley. Either the thigh-piece for the knee or the attachment to the two uprights for the hip joint is clamped and the other joints are released. When the limb is suspended from Corlette's or other type of Balkan frame, it must be prevented from "pitching" by fixing the cord in the pulleys by a little adhesive tape and by a cord round the foot of the frame.

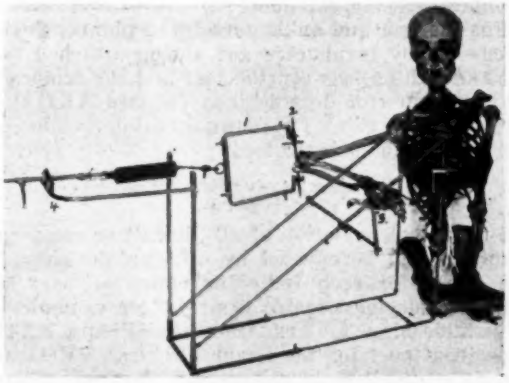

FIGURE XXII.
Method of reducing fractures or dislocations of humerus or of extending arm in open operation (especially with fragments impacted in shoulder or elbow joint and otherwise irreducible). 1: "universal stirrup"; 2: wire through olecranon; 3: "adjustable hand"; 4: screw traction.

(*d*) ***Mobilization for the Lower Limb.***—Reduction of contractures and adhesions, apart from subluxations, is effected for hip and knee by the action of gravity. But as the full weight of the limb may be too severe, some support by a weight is usually desirable. For flexing the knee the thigh is fixed in

the flexed position and the splint at ankle and knee joints is loosened. For flexing the hip, the knee joint bandaged onto the splint is raised by a weight and pulley towards the head, the sound limb being held extended, and all joints of the splint loosened. For extending the hip the frame is used for

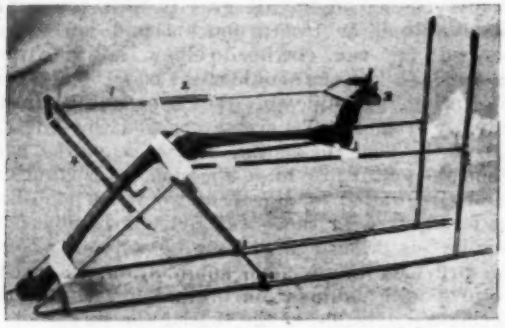

FIGURE XXIII.

Method of reducing a foot-drop (plantar flexion contracture). 1: turnbuckle; 2: spring; 3: sole stirrup; 4: foot suspension hoop.

gradually securing full flexion of the sound knee on the abdomen, while the affected knee is splinted in extension, the weight of the limb securing the extension at the hip. For extension of the knee the thigh-piece is fixed as low as possible, the knee and ankle joints are loosened and the limb is lifted in the splint from the lower end by weight over the traction pulley. Alternatively the whole splint may be loosened, except for the base, and the limb allowed to sag by its own weight, the knee bandaged in the splint thus being extended.

For the foot and ankle dorsal and plantar flexion is effected by turnbuckle and spring attached to a cord stretching between the foot and the removable carrier hoop (for dorsiflexion) (Figure XXIII) or the screw traction (for plantar flexion weight and pulley could be substituted).

Use for Mechanical Reduction of Fractures and Dislocations.

Mechanical reduction of all difficult or compound fractures can be effected by altering the shape of the frame for each individual joint or part and adding some inexpensive fitments, for example, an adjustable hand for arm fractures (Figure XXII), a perineal post for the femur (Figures XVIII and XXV), a small rigid stirrup for the foot (Figure XIV), and shoulder supports for the neck (Figure XXI).

Traction is provided from the frame by a strong cord or wire from a screw on a screw traction hoop which slides on the two uprights and is removable. I always include a spring scales to absorb minor movements and adjustments of the limb and to register the amount of traction.

Traction from the limb is taken by well-established methods—from the condyles by hooks, from the malleoli and *os calcis* by hooks or pin, from the toes or flexed fingers by flexible wire with spreader, from the olecranon and tibial tubercle by Beck's wires or fine pin, and from the head by Glisson's sling. Only in traction from the hand is a special method described. The leatherwork of Glisson's sling should be of Gambea leather to allow of sterilization. Hook, wire or pin may be attached to the cord by an assortment of recognized stirrups or by the one universal stirrup (*vide infra*). When the alternative of hook and pin exists, I prefer the hook, for example, in condyles and usually in *os calcis* or malleoli.

For reducing fractures of the leg the knee joint is fixed at a right angle (Figures XV and XVI) at a height corresponding to the length of thigh. The thigh is strapped into the thigh-piece to prevent extension at the knee, and the lower part of the thigh is protected against the loop by thick "Latex" rubber padding.

For the thigh, traction may be exerted either in the flexed or extended position of the hip joint. For the flexed position (Figure XVIII) the perineal post is used to prevent sliding on the splint, and the traction cord passes to the screw over one of the high pulleys. The struts are used to prevent bending of the uprights when great force is necessary. Abduction is maintained by the adjustable hand, clipped onto the base of the frame, fixed to the required distance and turned to lie against the sole of the sound foot. This method will be found of especial service during open operation or as an immediate treatment in the country prior to and during transport.

For the thigh in the extended position (Figures XXIV and XXV) the pelvic support is adjusted to the required height and traction is taken directly from the condyles. For abduction the adjustable hand may be lifted up into position, or if the practitioner possesses the accessories to complete an

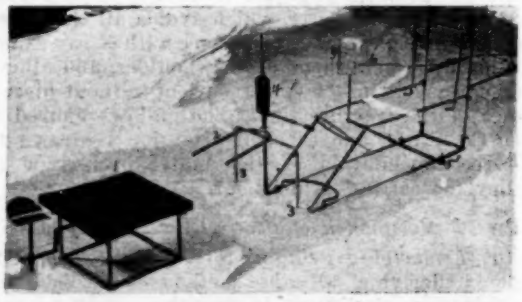

FIGURE XXIV.

The frame with accessories adapted for use as "orthopædic table" and ready for the patient. 1: body and head support; 2: pelvic rest with, 3, lateral stabilizer; 4: perineal post with strut to frame (5) and adjustable hand (5^1) (as foot support for sound limb in abduction) (extension by sliding along the frame); 6: an adjustable strut to fix the "hand" firmly to the traction hoop when extended.

orthopædic table (*quod vide*), it may be used as such. This method is of especial service in operations around the hip joint and femoral neck.

For both mid-thigh and mid-leg the frame possesses the advantage that the arms of the splint

are available to support and correct any tendency to sag at the site of fracture and to maintain the natural forward curve.

For forearm, wrist and foot the knee joint of the frame is fixed at a right angle, the thigh-piece of the

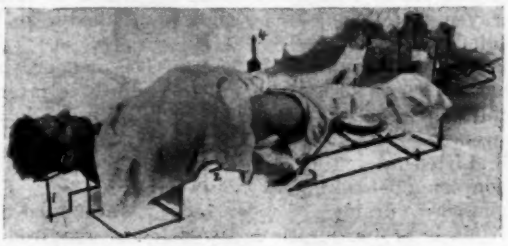

FIGURE XXV.

Patient on "orthopædic table". Drapes disarranged to show splint. Screw traction on right foot. Manual fixation of left limb in abduction and extension, left foot bound to adjustable hand. Inversion of left foot by rotating the hand plate, of right foot by adhesive to toe and heel. The numbers indicate the parts shown in Figure XXIV.

splint rests on the table as the base, and the traction loop is adjusted in the required position (Figures XII and XIII).

For comminuted fractures of the *os calcis* with loss of the arch (Figure XX), the pin through the tibia and fibula is attached by stirrup to a high loop and the *os calcis* is drawn down and back by the screw on the traction loop fixed low down. I have recently had a perfect result in this difficult fracture by applying the plaster over the pins left in position and making the patient walk with an iron heel by Böhler's method.

For shoulder, arm and elbow joint (Figure XXII) the frame may be used with the patient sitting and the frame supported on a table or box and held fixed to the patient by straps. But it is best used with the patient recumbent and the frame on a separate table, when straps are unnecessary. Padding is by "Latex" rubber, and the forearm and hand are held in any required position by the adjustable hand.

For the neck, the shoulders are held by the shoulder supports (see separate description).

The following advantages are claimed for the splint frame when it is used for mechanical reduction of fractures or dislocations:

1. Multiple frames are unnecessary, the one frame sufficing for any part of either limb or the neck.

2. It is self-contained, relying in no case upon skilled assistance or on traction or support from the wall.

3. When necessary, it provides support for mid-thigh or mid-leg fractures against sagging at the site of fracture.

4. It is universally applicable by simple adjustment for different parts. Methods are described, which I believe to be new, of reducing the thigh (in flexion), the cervical spine, and the forearm and wrist.

5. The patient proceeds from reduction to retention on the same splint.

Use in Open Operations.

Apart from the use of screw traction during operations on compound fractures, which has been fully discussed in my address on fractures around the elbow joint, the advantages are at once obvious of having available a method by which full extension, or even separation, of the fragments may be maintained or relaxed at will during any open operation for malunion or delayed union or for fractures otherwise irreducible. It is my belief that open operation on closed fractures will be rare with the routine use of screw traction for difficult cases. Results from open operation on fractures extending into joints have in the past been very disappointing, some form of wiring or pegging being usually needed.

But with the greatest care and skill there remains a proportion of cases, even with screw traction, which defy closed reduction and necessitate operation. Of such cases I have so far had no experience with the reduction frame, but it seems reasonable that a considerable proportion will be easily reduced and may then be maintained in position by simple closure without metallic fixation and by immediate application of skin plaster before relaxation of the traction. If necessary, I should prefer pins, passed through the bones at a distance from the fracture and incorporated in the plaster, or Corlette's "ice-tongs vice", to fixation by metal at the site of fracture.

The frame may be first set up as required and then covered with sterile drapes, the screw being manipulated by an assistant. It is better, however, to dismantle the frame, which takes only a moment,

FIGURE XXVI.

Fracture of upper third of the femur. Continuous extension without suspension. Abduction by loose attachment of sound limb to further end of long rod from adjustable hand. If possible, to be used only as preliminary to transport or to suspension.

sterilize everything and set it up again on a sterile table. The clean limb is then placed in it and the surgeon may himself manipulate it as he wishes and handle the frame freely for counter pressure *et cetera*.

Accessories.

The three pulley loops, mainly used for continuous extension without a Balkan frame, the traction loop for screw traction, and the foot loop for suspension of the foot, have been described under their various uses. The list of accessories is completed by

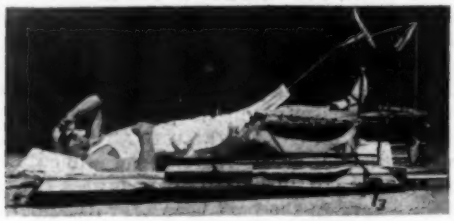

FIGURE XXVII.

Transport on stretcher (same patient), fifteen pounds extension on femur, five pounds on leg. 1: perineal post; 2: board lashed to stretcher; 3: adjustable hand attached to each side of frame of stretcher by adhesive; 4: spare rod of adjustable hand similarly attached at head end. This makes the stretcher rigid without cross-poles. The screw traction may be substituted for weights (5).

describing the adjustable hand and the perineal post and pelvic support required to adapt it to the uses of an orthopædic table.

The Adjustable Hand.

Construction.—The adjustable hand (Figure IV, 2) consists of a steel tube (numbered 1 in the figure), which clamps onto the frame transversely in any position. Through this slides a rod (numbered 2), which may be made to extend on either or both sides; the rod is clamped in the tube by set-screw and may with extensions completely cross a double bed. On the end of this rod fits a right angle tube (3), which carries a short rod (4); the short rod fits into a tube (5) welded onto a flat piece of aluminium roughly the size and shape of a hand (6). As each of the rods not only slides but rotates

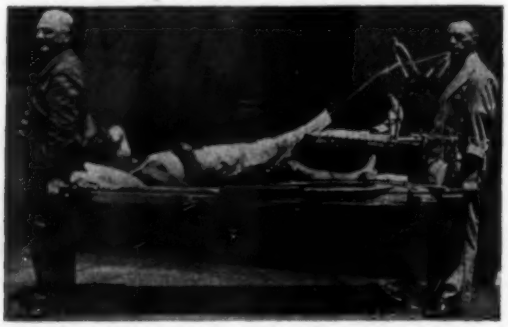

FIGURE XXVIII.

The patient shown in Figure XXVII being transported.

in its tube and may be fixed there by set-screw, the "hand" may be fixed at any distance from the frame, in any angle of abduction or adduction, and in any desired plane (see Figures VI, X, XXII, XXIV to XXVIII).

Uses.—The uses of the adjustable hand are as follow:

1. To serve as a hand support in mechanical reduction of difficult shoulder, arm and elbow fractures (Figure XXII). It can be made to hold the arm and elbow well away from the frame to allow X ray examinations to be made and plaster to be applied.

2. With the hand laid flat on the bed or operating table anywhere (Figure XVII) to reinforce lateral stability if required. This is especially useful in an uneven bed in the home.

3. Lifted up against the sole of the foot to act as a foot support (Figures XXIV and XXV). For permanent nursing a wooden block or a padded biscuit tin is preferable, as heavy pressure required to raise the body tends to rotate the splint frame. But

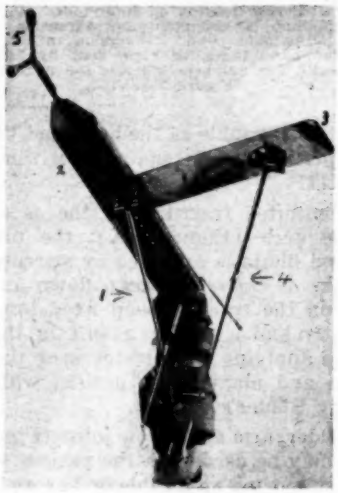

FIGURE XXIX.

Clavicle-to-elbow splint frame. 1: axillary hinge; 2: extension piece carrying 5, pulleys; 3: forearm piece; 4: sliding support of forearm piece. Note set-screws.

it suffices during transport (Figure XXVII) and during mechanical reduction of fractured femora or during operations on the neck of the femur, maintaining any required abduction (see orthopædic table).

4. With the hand against the bed frame and attached to it (Figure XXVII), to prevent sliding of the splint frame (best affected by raising or lowering the foot of the bed) or lateral movement (best effected by maintaining abduction).

5. To maintain abduction by loose attachment to it of the sound foot (Figure X).

6. To regulate and fix the abduction of the abduction frame when used with the orthopædic table.

The Orthopædic Table.

For some orthopædic operations, especially those around the hip joint, such as for insertion of a Smith-Petersen pin, combined abduction, traction

and internal rotation are necessary. It is easy to clamp the very convenient abduction-extension frame of the ordinary orthopædic table onto the splint frame for the purpose of these operations. It is quite possible to perform the operation without

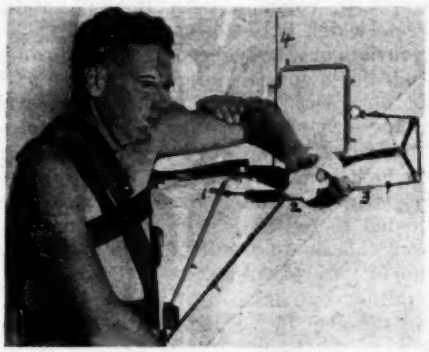

FIGURE XXX.

Mechanical reduction of supracondylar fracture. Traction cord over pulleys to sliding ring (1) set as for active exercise of shoulder in extension. 2: spring scales; 3: turnbuckle; 4: wire through olecranon.

an orthopædic table, using only the perineal post and pelvic support, with the universal hand for abduction, rotation and extension of the sound foot, extension being made by drawing the attachment of the hand splint distally by hand and clamping it taut with the aid of one of the adjustable struts (Figures XXIV and XXV). The operation is performed with the injured limb in the splint frame (sloping thigh-piece and horizontal leg-pieces). Rotation of the foot is maintained as required by adhesive plaster to the foot support loop. Traction is taken from the screw of the traction loop of the frame. With the thigh-piece of the frame sloping and the pelvis supported the region of the thigh and perineum is then quite free from apparatus to allow of operation, X ray examination *et cetera*.

The orthopædic table is completed by a body and head rest, which may be improvised, or by the universal body and head rest described and figured elsewhere.

The Shoulder Supports.

The shoulder supports are illustrated in Figure IV, and their use is described in the section dealing with the reduction of dislocations of the neck (Figure XXI). They are ordinary shoulder supports, welded to a short tube which slides on the thigh-pieces of the frame, being fixed as required by a set-screw.

The Perineal Post and Pelvic Support.

The perineal post (Figure IV) may be fitted to the frame on either side by sliding it under the longitudinal member of the base, where it is clamped. Extra strength is given by the use of the adjustable strut, clamping it to the thigh-piece. A pelvic rest, adjustable for height (Figure XXIV), may be slipped over it for the purposes of an orthopædic table.

Summary of Advantages Claimed for Universal Splint Frame.

1. It is collapsible and easily packed into a suitcase.
2. It can be sterilized.
3. It is adjustable for length of thigh and leg, and for angles of hip and knee from full extension to less than a right angle, and for position of extension pulleys.
4. It can be used both for mechanical reduction of all fractures of the limbs and neck, and for retention of any fracture of the lower limb or arm, and for the mobilization of stiff joints.
5. It can be used for nursing fractures in suspension by Corlette's improved methods, or without suspension with continuous extension, or for simple elevation of the limb pending examination and reduction.
6. It allows movement of all other joints when one joint is immobilized by plaster or by bandaging to the splint.
7. It allows early active movement of the affected joint without removal from the splint.
8. As a mechanical traction frame it has advantages over other frames which have been discussed.
9. It has a separate field of usefulness in securing and maintaining length and alignment during open operations on new or old fractures. This includes its use, with accessories, to form an orthopædic table.

FIGURE XXXI.

Condylar fracture in flexed supinated position, supported by splint in abduction. Hand fixed in position by set-screw at 1 and wing-nuts at 2 and 2¹. Active movements at shoulder allowed by releasing set-screw at 3.

10. The patient can easily be transported by stretcher (*quod vide*) without removal of extension or abduction of the thigh, an advantage where a portable X ray apparatus is not available, or for removal of a patient to home or hospital.

THE CLAVICLE-TO-ELBOW SPLINT FRAME.

Uses.

The clavicle-to-elbow splint frame (Figure XXIX) has been evolved for ambulatory treatment with the idea of having within the compass of a single apparatus a splint that will carry out

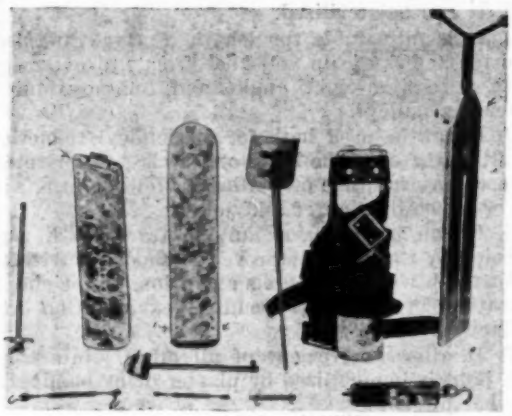

FIGURE XXXII.

Clavicle-to-elbow splint frame, disassembled. Above, left to right, are: forearm support, upper tube; arm-piece, perforated for adjustment; arm-piece, lower end, arm and forearm supports, rods, on removable plate; body-piece, with attached Gambea belts; extension piece, with pulleys. Below, left to right are two turnbuckles. Above is the arm support, upper tube, with fixing plate and wing-nut; then come hinge-pin and spring scales. Note holes marked with arrow for mobilizing with turnbuckle and spring.

the eight functions and accord with the five ideals discussed at the outset of this article. As its name suggests, it can be used for the treatment of all fractures and contractures from the clavicle to the elbow inclusive.

Indications for Abduction and Elevation of Elbow.

The indications for abduction and elevation of the elbow have been fully dealt with in the address, complementary to this article, on injuries around the elbow joint, which contains further illustrations (see THE MEDICAL JOURNAL OF AUSTRALIA, December 26, 1936, page 881). I wish to stress here the outstanding importance of elevation of the elbow from the moment of injury in that region. It is a region where œdema is particularly troublesome, both in examination and in treatment. It is also dangerous, especially in occupational accidents, because of the common sequela of stiff fingers from damage to their delicate mechanism by embarrassed venous return.

First aid instructions do not stress this, and patients are usually treated with the elbow dependent. This is quite wrong, and as a result the patient, especially if an adult, reaches the surgeon with all landmarks obscured and the local, if not the distal, circulation embarrassed. It should be a cardinal point of teaching for first aid and for ambulance and hospitals staffs that from the outset the elbow should be supported high on pillows. The patient should be recumbent, unless an abduction splint is available. This will facilitate the work of the surgeon, greatly increase the comfort of the patient, and contribute in no small measure to improvement in final results.

Construction.

The clavicle-to-elbow splint frame has the following features in common with Böhler's abduction splint, from which it has been developed.

1. It consists of a body-piece, from axilla to pelvic brim, hinged at a forward angle under the axilla to a supporting piece for the arm, which carries a rotating forearm support that can be clamped in various positions.

2. It is held firmly against the body by an upper and lower strap and can be lifted well into the axilla and adjusted there (a very important point) by a strap over the sound shoulder obliquely from the lower end of the body-piece.

3. A pulley extension piece can be provided, attaching the arm by cord over the pulleys to the body-piece.

It differs from Böhler's abduction splint in the following respects:

1. The attaching bands are of Gambea leather to allow the use of steam sterilization of the splint and bathing of the patient.

2. The foreward angle at the shoulder has been increased to 40°. The splint can easily be moved backwards, but moving it forwards brings the body piece against the flexure of the thigh, preventing sitting. I have found 30° to be very uncomfortable in some adults.

FIGURE XXXIII.

Clavicle-to-elbow splint frame, fracture of middle third of clavicle, second week. 1: retaining belt for inner fragment; 2: arm-piece, dropped; 3: hand support of "Dunlopillo" latex, one inch thick. Showing exercise of all joints of limb. Patient also has plaster for left supracondylar fracture.

3. To make it reversible as to side, the axillary hinge is secured by a removable rod of aluminium, held from slipping by split pins, and the supporting rods are hinged by universal joints. The side is

reversed by turning the lower surface of the arm support upwards.

4. To make it adjustable as to size, the forearm piece can be attached by wing-nuts through a choice of holes in the arm-piece (Figures XXIX and XXXII). The extension piece is removable and extensible, sliding the full length of the arm-piece, and may be fixed at any length by a wing-nut. These points are important, because a non-removable extension piece makes the splint very ungainly when the patient is walking in company or through doors, and yet the length must be considerable when the use of the traction stirrup is needed. The rectangular margins and the full length of the extension piece (Figure XXXII) will be found useful when active exercise of the shoulder is undertaken with continuous extension of the arm, to prevent bending of the arm support and alteration of the tension.

FIGURE XXXIV.
Another view of patient shown in Figure XXXIII.

5. A separate support is provided for the forearm piece from the plate at the lower end of the side piece (Figures XXXI and XXXII).

6. The support for both arm and forearm pieces is provided not by supports of fixed length, but by steel rods, sliding in steel tubes, which can be fixed at any length by set-screws. The purpose of 5 and 6 is the following (for figures see my other paper, "Injuries Around the Elbow Joint"): (*a*) It gives greater stability to the forearm piece in any position. (*b*) It enables a full range of abduction of the arm and of flexion of the elbow without removal from the frame. Each piece can be firmly clamped and supported in any part of its arc of movement while the other remains movable. (*c*) The flexed antero-posterior position of the forearm for certain elbow fractures has many advantages. The splint can be clamped at the elbow for use in this position, combining its advantages with those to the shoulder joint of active movement (Figure XXXI) and to the circulation of abduction. (*d*) It makes the position secure while the patient is lying down and avoids the risk of the support becoming displaced by accident or in sleep.

7. Early active movement at the elbow joint through its full range is possible without removal of the bandages or further support, because the length of the arm-piece can be so varied that the bend of the elbow in the limb and in the splint coincides.

8. Provision is made for early active movement of the shoulder joint, free of the action of gravity (*vide infra*).

9. Mechanical reduction of an arm or elbow fracture by wire or pin is made easy while actually on the splint (Figure XXX) by provision of a turnbuckle and a spring scales (both to measure the pull and to equalize the strain for slight movements of the shoulder). These are attached at one end to the traction loop (*vide infra*) and at the other by cord over the pulleys to the stirrup holding the pin or wire through the olecranon. The turnbuckle allows any required amount of traction and the stirrup holds the elbow up off the splint sufficiently to allow easy application of plaster, if that is desired. Plaster of Paris, if used, may then be allowed to set with the limb on the splint. The Beck's wire remains until the surgeon is satisfied with the position of the fracture. The traction by adhesive applied to the dried plaster is substituted without interruption of the traction before the Beck's wire is removed.

10. Provision is made for the treatment of limitation of movement of the shoulder by a weight over a pulley on a cord attached through a hole in the end of the arm-piece. For the treatment of limitation of extension or flexion of the elbow by spring traction and exercise, holes are provided in the splint, at wrist and shoulder, to carry a cord provided with a spring and turnbuckle. The turnbuckle provides the necessary fine and varying adjustment of the force required, and the spring converts the

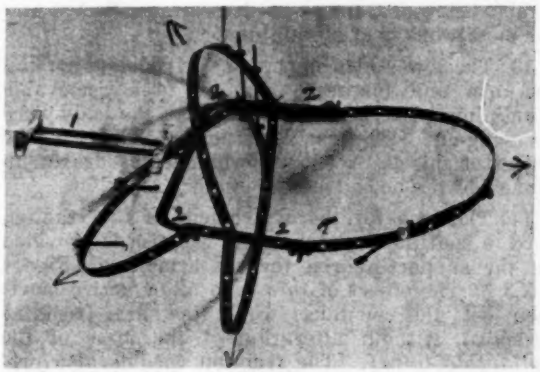

FIGURE XXXV.
The hand splint frame carrying all four carrier hoops in positions at random. 1: forearm; and 2: two fork-like projections on either side of hand, perforated for carrier hoops. Arrows indicate line of pull that may be obtained from each.

force into an elastic pull on the end of the forearm-piece, which holds the forearm.

11. The pulleys on the extension piece are placed evenly above and below the plane of the arm-piece and the extension piece itself has its edges right-

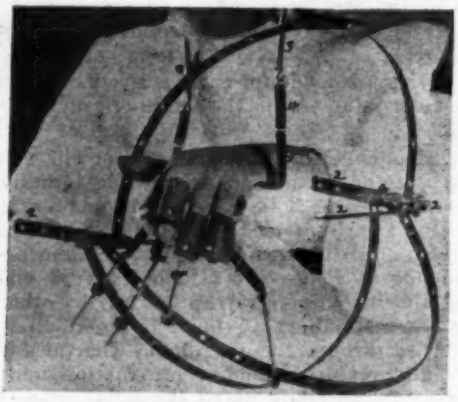

FIGURE XXXVI.

This hand and wrist were at first fixed in every joint but those of the thumb. The figure shows early flexion of the fingers; 3: screw; 4: spring; 5: palm stirrup.

angled (Figure XXXII). The object of this is to secure stability, free from bending effects, and an even pull in every position of the shoulder joint during continuous extension of the arm, combined with exercise of the shoulder joint.

12. "Latex" rubber is used as padding. Although not part of the splint, it is mentioned again here because of the very important point that the patient may enjoy a warm bath while in his splint. The straps, being of Gambea leather, are unaffected and the metalwork is of aluminium.

13. The lower attachment of the rods supporting the arm and forearm pieces is to a removable aluminium plate, which clamps onto the body-piece by wing-nut (Figures XXXI and XXXII). The object of this is to allow clothing to be drawn up alongside the body (see "dressing").

14. The loop for the attachment of the traction cord in continuous extension of the arm is provided on the supporting rod for the arm-piece (Figure XXX). The object of this is to allow active movement of the shoulder while the arm remains extended, without alteration of the force of the pull (*vide infra*). The traction cord is also protected by the extension piece from accidental jars, pressure during sleep *et cetera*.

Method of Adjustment to Patient.

When this splint is adjusted to the patient, tight-fitting frocks in which it is not desired to open the shoulder and arm-hole seams, and all tight-fitting under-garments are not removed, but are left resting on the hips. The injured limb is slightly abducted and the body-piece of the assembled splint (Figure L shows the adjusted limb being exercised at the shoulder) is laid against the flank with the shoulder joint of the splint well up, resting against the two folds of the axilla, a strip of "Latex" rubber, six inches wide, from pelvis to elbow forming the padding. The oblique strap over the sound shoulder is tightened (padded over the clavicle) and then the upper body strap (also padded over the folds of the sound axilla). The lower strap is left until final adjustments are made. The arm-piece is then abducted to 100°, the limb being lifted with it. The set-screw is tightened, the forearm piece is fixed in the required angle of flexion, and its support is also fixed by set-screw. The level of the splint in the axilla and the forward set of the arm from the frontal plane are then critically examined and, if necessary, adjusted by tightening or loosening the straps. The lower body strap is tightened without padding. The limb is then bandaged or secured with adhesive to the splint. The whole process is simple, quick and painless. The patient may now be transported and examined by X rays. The necessary manipulation for reduction of deformity is carried out with the set-screws loosened and the frame is dropped by the side, if manipulation is done manually, and then the abduction is replaced with the elbow joint in any required position. If manipulation fails, or operation is required for compound fractures, or powerful traction is required on the arm for dislocation or for fragments impacted in shoulder or elbow joint, mechanical traction is available on the splint (Figure XXX).

Use for First Aid by the Practitioner.

The splint may be easily and comfortably applied over the clothes without any padding. Arm and forearm may be secured to the splint and the patient transported, either lying or sitting, with the comfortable assurance that it will not shift and

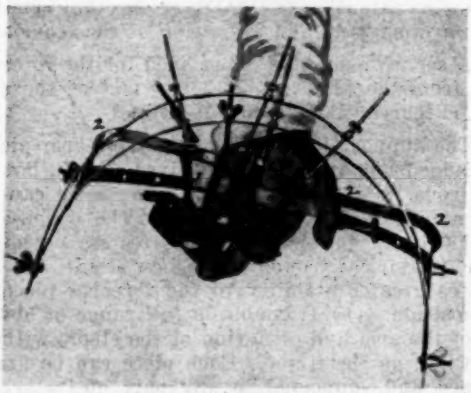

FIGURE XXXVII.

Same as Figure XXXVI from the palmar aspect.

that the injured part is well elevated. For the clavicle a pad around the shoulder joint of the splint, with the arm and forearm pieces by the side, and a pad under the hand for support, not only

gives comfortable transport, but reduces the deformity. It will thus be seen that for any injury of the upper limb it provides all the requirements of splinting pending transport, X ray examination *et cetera*.

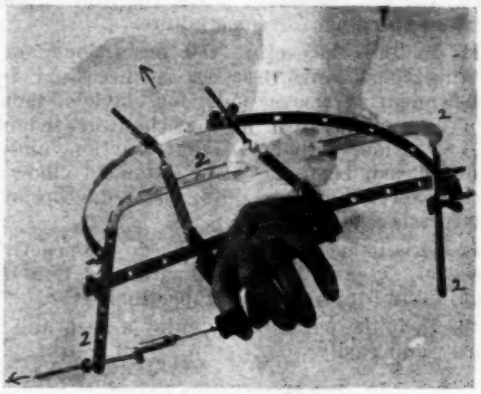

FIGURE XXXVIII.
Adducting the index, dorsiflexing the metacarpus.

Nursing at Night.

At first I had complaints of discomfort caused by abduction splints while the patient was in bed. This has been remedied by attention to the following details: (i) A firm mattress with no longitudinal sagging is required; this eliminates forward flexion of the spinal column and uneven pressure. (ii) The bed should preferably be against a wall on the injured side. The arm can then be well packed up with pillows, which do not tend to shift. The patient is comfortable when the wrist is vertically above the mouth, as movements to either side during sleep do not then cause a pull on the encircling body straps owing to the weight of the limb. The increase of the forward angle to 40° made all the difference in this respect.

Contraindications.

The contraindications to the use of this splint are those to the use of firm encirclement of the thorax—chronic or acute pulmonary or cardiac disease, advanced age, feebleness and infancy. If abduction is required in such cases, Corlette's method of continuous traction (see "Universal Splint Frame", Figure IX) should be used.

Use as a Clavicle Splint.

This splint possesses no advantages over the wooden Böhler clavicle splint except that, possessing this universal type of upper limb frame splint, the practitioner has it always available. He can apply it at once and have a wooden splint made at leisure to free his frame splint for emergencies.

I have provided a cylinder of aluminium to screw onto the shoulder joint of the splint and a strap of Gambea leather to hold down the outer fragment of a clavicle fracture or a dislocated acromio-clavicular joint. Both can be improvised, the strap from household straps and the cylinder from padding. A one-inch-thick strip of "Latex" rubber, strapped by adhesive plaster to both sides of the shoulder joint of the splint, forms an ideal substitute for the cylinder. "Latex" rubber seems to me to be a great advance on all other forms of padding.

Results are so good with Böhler's method and the method is so simple that it hardly seems worth while to point out that this new splint provides the means of continuous traction upwards and backwards of the shoulder girdle. With the arm supported on the splint in the usual abducted and 40° forward position, and the forearm supported on an aluminium sheet clamped in the place of the usual forearm-piece, the forearm-piece, with its support, can be swung backwards and clamped high. By means of a short hook engaging the spino-acromion angle the outer fragment can then be pulled with any required elastic force in the line of the inner fragment. I have no experience of this method, which offers the theoretically ideal solution of immobilization and continuous traction on the short outer fragment with free movement of all other joints. It might also be considered for the notoriously intractable dislocation at the sterno-clavicular joint.

Dressing.

In the male, shirts and underclothes are best slit along the shoulder seam and around the armhole, the sleeve being detached and the waistcoat shoulder seam slit. The clothes can then be slipped up around the body under the detachable supports pinned over the shoulder, and the sleeve pinned to them and over the limb to the bandage on each side.

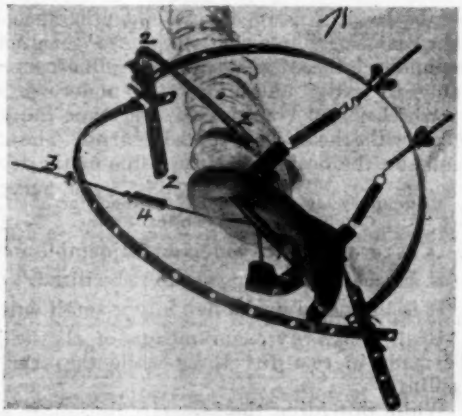

FIGURE XXXIX.
After four weeks. Some extension of the metacarpus. First stage of flexing fingers into the palm (one only is shown for clearness).

In the female, for daily wear it is best to adjust the frock so that it buttons from hip to neck at the side, the sleeve being free over the limb. Undergarments give no trouble, as they may be drawn up under the detachable support, except that a small

opening must be made for reattachment of the supports. For the first dressing, when the patient is unprepared, all tight-fitting, one-piece underclothes should be left on the hips and subsequently drawn up around the body. For the frock it may

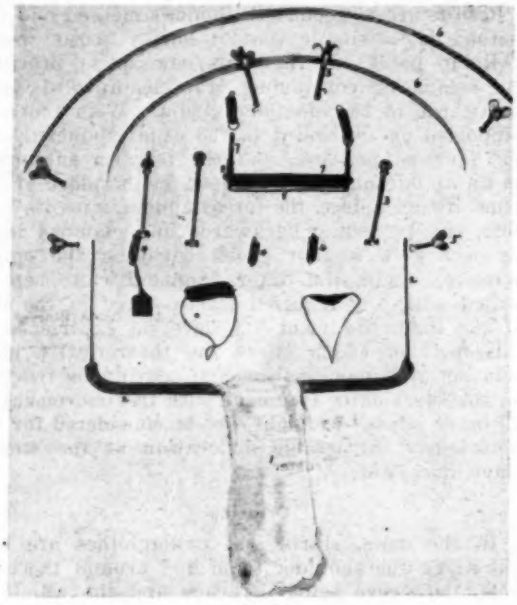

FIGURE XL.

Accessories. 1: Plaster-covered forearm piece; 2: carrier arms; 3: two types of screw; 4: springs of different strengths; 5: wing-nuts for fixing carrier hoops to arms of frame or to each other; 6: different lengths of carrier hoops; 7: palm stirrup with 8, adjustable roller.

either be so drawn up, the shoulder being covered with a scarf, or it may be slit at the seams as for male underclothes, or it may be slit from waist opening to axilla and along the underarm seam, after which it must be passed first over the splint, then over the head and opposite arm. The choice depends on the design and the value of the frock.

Summary of Advantages Claimed for the Clavicle-to-Elbow Splint Frame.

1. It is reversible for side and adjustable for size.
2. It can be taken to pieces and sterilized.
3. It is light and packs flat into a small suit-case.
4. It allows X ray examinations of all the joints to be made in two directions while the arm is on the splint.
5. While providing the best circulation, it allows any angle of abduction or of elbow flexion. The angles can be altered without disturbance of the bandaging after turning a set-screw.
6. It fits firmly, high in the axilla, taking the weight on the pelvis and on the sound shoulder.
7. Independent of posture, the support cannot be displaced by accident or during sleep.
8. The pulley extension is removable and adjustable for length and is so arranged that continuous extension of the arm does not preclude active movement at the shoulder joint.
9. It allows for active movements of all other joints, free of gravity, while the injured joint is immobilized.
10. The 40° angle forward of the frontal plane is more comfortable for some adults.
11. In the one splint the practitioner or the visiting consultant possesses the necessary frame, independent of size or side, for clavicle, shoulder, arm and elbow, for: (*a*) mechanical reduction; (*b*) retention, with or without traction, and with either flexed, right-angled or extended elbow; (*c*) active exercises of all joints; (*d*) reduction of contractures or adhesions.
12. It is immediately available to the practitioner for first aid and transport, with elevation of the limb, in any injury of the upper limb.
13. In it the patient may enjoy a bath and dress neatly and easily.

THE HAND SPLINT FRAME.

Used as a Spring Traction Splint for Stiff Fingers and Wrist.

Originally designed by myself especially for the reduction of rigidity in wrist and fingers by the principle of continuous spring traction, this splint has been so made that the direction of pull on the hand or on any separate phalanx can be varied through 360° in any plane.

It consists of a simple iron frame for the forearm with two perforated carrier arms extending on either side of the hand (Figure XXXV). Into the perforation can be fitted, as required, one, two, three or four semicircular spring steel hoops, also perforated for the screw and spring (Figures XXXVI and XL), which maintain traction on hand or phalanx through a soft leather or padded iron bucket (Figure XL). The hoops can be fixed firmly in any position of rotation by wing-nuts. As the whole length of each hoop is perforated at intervals, it follows that traction can be made in any direction

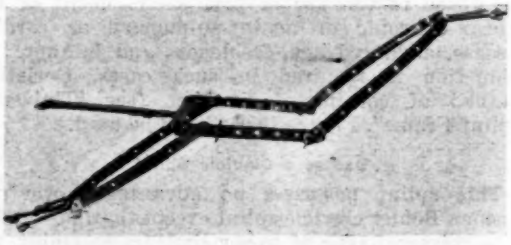

FIGURE XLI.

Hand frame set up for reduction of fractures of metacarpus or phalanges.

from the hoops. Traction of the terminal phalanx into the palm is obtained from a special palm stirrup (Figures XXXIX and XL).

Firm purchase from the forearm is obtained by moulding the stirrup onto the dorsal or volar sur-

face of the forearm by incorporating it in a plaster of Paris slab. When set, it is held in position by a bandage and can be removed and reapplied at will.

Traction can be made from as many points as required, so that in the more severe deformities of

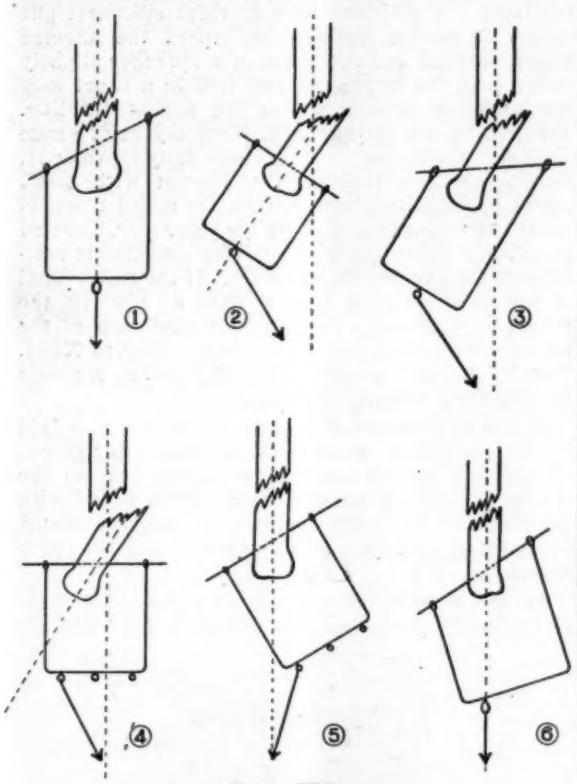

FIGURE XLII.

Illustrating the action of (a) fixed-shape, (b) three-looped and (c) adjustable tractors. (1): Oblique pin, straight pull obtained by unequal arms. (2): Oblique pin, transverse to an oblique fragment, obliquity corrected by a pull with equal arms or by any fixed-shape tractor. (3): Transverse pin in oblique fragment, treated by unequal arms, result as in (1). (4): Transverse pin, markedly oblique fragment, treated by three-looped tractor. Note that the obliquity has to be marked to pass outside the outside loop. But to get exact replacement the axis of the fragment must pass exactly through one of the loops. (5): Replacement of the fragment in (4) will result as in (5), with immediate redisplacement, but less than before. (6): The difficulty can be overcome by lengthening the arm opposite the displaced upper end.

the hand after crushing accidents as many as twelve different pulls may be exerted at the same time for different parts of fingers, thumb and wrist. As the traction is by spring, active exercises may be indulged in at any time without disturbance of the splinting, the range of movement already obtained thus being preserved and the nutrition of the parts being maintained. Active exercises are an essential part of the treatment.

The force of pull may be varied by the patient from time to time by turning the thumb-nut of the screw at the carrier hoop. This is important. All fixed frame apparatus needs daily attention by the surgeon, and even then the patient is liable to fall between the Scylla of over-tension (with the possibilities of trophic sores or aggravation of the lesion) and the Charybdis of under-tension. The instruction given to the patient is to keep up the tension short of active discomfort.

The objection to this frame, that of difficulty in dressing, is overcome in the treatment of the intelligent patient by allowing him to adjust his own frame after dressing. When checked up by the surgeon, my experience is that the average patient becomes expert in its application and derives considerable interest from it. In the treatment of the unintelligent the clothes are split at the seams of arm and shoulder and pinned or buttoned. The trouble of this, however, is minimal compared with that of continued disability.

Method of Use.

With the plaster mould fitting snugly well round and well up the forearm and with firm bandaging, the difficulty of stability, common to all hand splinting, is overcome.

The methods of flexing and extending, adducting and abducting wrist, thumb and fingers are obvious, by simply pulling in the required direction to a hole or holes in a revolving carrier hoop set at any required position (Figures XXXVI to XXXIX).

Final flexion of the fingers beyond a position where the terminal phalanx was at a right angle to the metacarpal for a long time presented difficulty owing to the buckets slipping off, even with the wrist fully extended by a stirrup. This has been overcome by using indirect traction over a roller in a palm stirrup (see Figure XXXIX). The stirrup is first applied to the palm to extend the wrist by strong traction. The stirrup carries a roller adjustable as to position in the palm. Under this roller pass the threads from each side of a wash-leather bucket on the terminal phalanx, which thus draw the phalanx down onto the roller. Beyond the roller the threads pass to a spring and screw attached to a carrier loop in any convenient position. The position of the palm stirrup, whether below or above the transverse palmar crease, can be varied by altering the position of the carrier loops, which draw the palm stirrup with the hand dorsally and the threads over the roller ventrally.

Advantages Claimed for the Splint when Used for Mobilization.

The following advantages are claimed for the hand traction frame when it is used for mobilization:

1. Mobilization is effected by continuous elastic traction, active exercise being allowed through the range of movement gained.

2. It allows traction in any and every direction, including flexion of the fingers right into the palm and all movements of the wrist.

3. It is adjustable to comfort and to efficiency by the patient with very little supervision.

4. It is a universal splint, the one splint serving for any size after early childhood, for either side, for all types of contracture, for treatment of mul-

tiple lesions concurrently, or for reduction and retention of fractures.

5. It can be dismantled and sterilized.

Used as a Fracture-Retention Splint.

The hand splint frame is especially useful in conjunction with plaster of Paris for displaced or compound fractures of the metacarpals and phalanges.

FIGURE XLIII.

Applying the adhesive strapping for mechanical reduction of forearm and wrist fractures and dislocations by the "universal stirrup" and Steinmann's pin. Note two pieces of felt to secure the grip of the adhesive on the middle and ring fingers. The universal stirrup is used with a straight pull, fitted with a Steinmann's pin.

The desiderata of (i) anatomically correct reduction and retention, (ii) the position of relaxation of as many joints as possible, and (iii) early active movements through the full range of the unaffected fingers are certainly attained by the methods described in Böhler's latest book. But in practice I have found the wire finger splints very difficult, almost impossible to mould to my satisfaction, when several fingers are involved. The correct adjustment of the wire through the finger tip first to the tip of the finger splint and through that to the cuff of the plaster splint I have found still more difficult.

The fourth desideratum of early active movement without removal from the splint is not attainable without removal of the wire.

At first sight, the provision of a special splint like this may seem unnecessary to many practitioners. But an extensive experience of the end results of compound fractures of the fingers convinced me that the results were often seriously and permanently disabling. It was in the treatment of numerous apparently permanent disabilities that the splint was evolved, and since I have used it according to the principles learned from Böhler for the initial treatment of such cases, I have been astonished at the rapid return to work of patients with multiple compound and displaced fractures.

Method of Application.

First, wounds of the hand and fingers must be attended to according to the rules for compound fractures. A stainless wire or thick silkworm gut suture is passed through the tip of the affected finger, through the two holes in a spreader slightly wider than the finger tip, and tied in a short loop for ultimate attachment to the spring traction. The fingers are covered with three layers of gauze (spiral bandaging being especially avoided), lightly held together on the dorsum with small pieces of adhesive plaster. Then the splint frame is arranged with a loop fixed on the volar side, directed proximally at an angle of 30° (for continuous traction on the affected finger later). If the metacarpal is fractured, another loop is fixed at 150° on the dorsal side, directed distally (for extension of the metacarpal during plaster fixation) (Figure XLI). For a Bennett's or other thumb fracture a single loop is fixed directly distally.

A few thicknesses of a plaster slab are now laid on the dorsum of the forearm and the splint placed on them is incorporated in a plaster cast to the whole forearm, wrist and base of the hand, with the hand in moderate dorsiflexion, and the thumb is kept abducted by a pad between it and the index finger.

If the metacarpals are intact, the plaster is immediately carried on the dorsum to the knuckles.

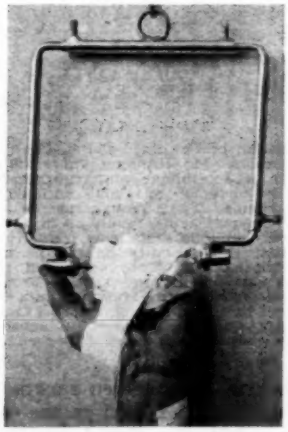

FIGURE XLIV.

The application of adhesive strapping for mechanical reduction of forearm and wrist fractures and dislocations. Note the oblique strips of adhesive over thenar eminence onto dorsum of forearm. Pad between fingers and thumb removed for clearness.

If a metacarpal fracture with deformity exists, the plaster is allowed to become firm for a few minutes until the frame is firm on the forearm, then the tip of the finger or thumb is attached by the loop to

the spring and the screw is tightened. This draws the finger distally in dorsiflexion and suffices in most cases to reduce the deformity, but a little manipulation by the surgeon at the site of fracture may be needed. The plaster is continued onto the knuckles, care being taken to wet it freely again if it has dried, the surgeon moulding it with flat fingers to the dorsum as it sets; he must take care not to cause relapse of the flexion deformity. The same manœuvre serves for the Bennett's fracture, but stronger traction and firmer moulding are required. The hand is now in dorsiflexion with the metacarpal fracture and dorsum of the hand held in good position against its dorsal mould. The pad holding the thumb in abduction should now be removed, and, except in fractures of the thumb or its metacarpal, should be temporarily replaced by a strip of adhesive from the thumb to a convenient part of the frame, as it interferes with the application of the palmar plaster.

Figure XLV.
The application of adhesive strapping for mechanical reduction of forearm and wrist fractures and dislocations. Note the dorsiflexion of the hand when traction is applied.

To fix the finger in the required flexion, three thicknesses of the plaster gauze are cut, seven inches by four inches (for an adult) and folded lengthwise twice, to make twelve thicknesses seven inches by one. For two or more fingers or the thumb a wider strip is needed. But first the plaster cast is continued into the palm as far as the transverse palmar crease, but not beyond it. The crease must remain visible, otherwise the unaffected fingers will not fully close into the palm during treatment—an important point.

The finger (but not the thumb in Bennett's fracture) is now released from its traction. With one hand the surgeon places the finger in the required position (*vide infra*) and with the other he moulds the wet strip inside the finger from the distal finger crease to the palm. For metacarpal fractures the proximal phalanx should be very slightly flexed at about 10° only. For finger fractures it should be at 45°. The middle joint of the finger should in all cases be at a right angle. For fractures of the thumb phalanges both joints are comfortably flexed, but not over-flexed, usually in the adult at about 60° for the proximal and 30° for the distal joint. The surgeon moulds the plaster to the finger as it sets, maintaining the position of the fracture line both by pressure from the palmar surface and by traction from the sides of the finger. In adults I mould the cast in my own flexed finger and transfer it, partly set, to the patient, with a little fresh, sloppy plaster to unite it to the cast in the palm.

When the plaster has firmly set, the loop through the finger tip is attached to its spring and screw on the proximal carrier loop. In the fingers the terminal phalanges should be parallel to the metacarpals in all cases. In the thumb the terminal phalanx should be flexed to slightly more than a right angle on its metacarpal for phalanx fractures, but flexed only to 30° for Bennett's fracture. The screw is set to give just enough traction, and no more, to hold the phalanx lightly in position, and the patient is instructed to relax the screw if œdema causes the traction to become painful.

It may happen that the end of the digit is pulped and will not retain a wire without risk to its vitality. In such a case a strip of adhesive plaster along the dorsum may replace the wire for traction, or the digit may be gently bound to the plaster mould by elastic adhesive plaster. Encircling non-elastic adhesive plaster should never be used. No further dressings are used, as finger and hand wounds do best with free access of air. But the remaining carrier loops are fitted on, a cage being so formed to protect the hand against contact with bedclothes *et cetera*.

Advantages Claimed for the Hand Splint Frame when Used for Recent Fractures.

1. It dispenses almost entirely with assistance, the surgeon being in control of every manipulation, aided by the mechanical traction.

2. The joints of the affected digit are held in flexion, the lateral ligaments being kept stretched, shortening during treatment thus being prevented and full movement into the palm after union being ensured.

3. Active movements of the digit against the spring are possible after the first few days, nutrition, circulation and mobility being thereby maintained. This is possible because the tension on the flexed joints by the spring overcomes the angulating pull of the extensors.

4. The traction on the tip of the digit is not fixed, but is elastic and adjustable to comfort, the very real dangers in fixed methods of cutting by the wire or sloughing of the volar skin by pressure, or in methods with encircling dressings of superficial necrosis of the digit, being avoided. The spring takes up minor increases of œdema, and pain warns the patient to relax the tension in a more gross case.

5. The intractable tendency of the flexion deformity to relapse is prevented by the continuous traction.

6. Full movements of the unaffected fingers into the palm are carried out from the first day, nutrition and flexibility of fingers, hand and wrist being maintained.

7. The one splint frame combines the functions of mechanical reduction, anatomical retention and treatment of existing contractures or adhesions in accordance with the principles laid down in the introduction.

Dupuytren's Contracture.

I have had no opportunity of using the hand frame for Dupuytren's contracture. As, however,

the frame would be easily adjusted for its treatment, it seems reasonable to use it, either alone or in conjunction with local incisions. Intermittent treatment for a few hours every week might very well be found to restrain the tendency to flexion, particularly in its early stages, and so limit it to its non-disabling stage.

A New Traction Stirrup.

In using traction stirrups for reduction of fractures and dislocations and also for continuous traction the following difficulties have been encountered:

1. A range of sizes has been found necessary for each method of traction (by wire, by pin and by the modified Schmerz hook), some of the instruments being very expensive. If the full range is not in the possession of the surgeon, delay in treatment is inevitable. As all fracture reduction is urgent for many reasons, delay always results in temporary, if not permanent, detriment.

2. In the usual spring steel type of stirrup very considerable force is necessary to separate the ends of the stirrup sufficiently. This may result, in the case of the pin, in some trauma to the patient, and in the case of the hook in some difficulty in correct placement of its points. In both cases the actual detriment varies with the skill and experience of the operator.

FIGURE XLVI.

This figure, together with Figures XXII, XLIII, XLIV, XLV, XLVII and XLVIII, illustrates the "universal" traction stirrup. "Schmerz hooks" form the arms, fitted for a straight pull.

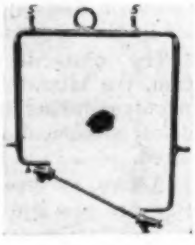

FIGURE XLVII.

The universal traction stirrup fitted with Steinmann's pin. Marked deviation is obtained by deviating the loop to one side, at the same time lengthening one arm.

3. With the standard stirrup very little space may be left between the arms of the stirrup and the patient's limb, or between its arch and the end of the limb. This makes plaster application difficult, and in the hands of an inexperienced operator possibly uneven.

4. When the hook, wire or pin is placed absolutely transversely to the axis of the fragment held, the pull from the centrally-placed loop of the stirrup will be even [Figure XLII, (2)]. But in my hands at least the placement is seldom absolutely transverse [Figure XLII, (4)]. This results in an uneven pull, tending to lateral displacement of the line of the lower fragment. The difficulty has been partly overcome by Corlette's suggestion of three alternative loops on the arch of the stirrup [Figure XLII, (4) and (5)], but fine adjustments are still impossible.

A demonstration is made of a stirrup, which it is claimed largely overcomes all these difficulties. Essentially it is constructed as follows:

1. The loop for traction is centrally placed over a double steel tube (Figures XLIII to XLVIII).

2. Into each of these tubes slips a right-angled arm, which can be firmly fixed at any distance from the loop by a hollow pointed steel set-screw. This device (*a*) permits of wide variations in the width of the stirrup, and (*b*) by sliding the double tube towards either limb, without variation of the width, the traction loop can be placed at any required distance off centre (Figures XLVII and XLVIII).

3. Into these arms slip the "feet", which can also be fixed by set-screw at any length, so that the completed arms may be equal but of widely varying width or may be adjusted to be of unequal length. This device permits of: (*a*) An obliquely driven pin or wire being held by arms of correspondingly unequal length, giving a straight pull [Figure XLII, (1)]. (*b*) A transversely driven pin being held by unequal arms, so that when a pull is made in the axis of the limb the shorter arm tilts down that end of the pin, displacing the upper end of the short fragment to the side of the short arm [Figure XLII, (3), result as in Figure XLII, (1)]. (*c*) A transversely held pin being held by arms of equal length, so that when a pull is made in the line of the limb, but from a loop to one side of its axis, the pull comes first on the end of the pin on the side of the displaced loop, so displacing the lower end of the fragment towards the axis of the limb [Figure XLII, (4)].

This will be more easily understood from diagrams. It must be remembered that in the screw traction apparatus the screw is in the axis of the limb. So that if the loop of the stirrup is not in the axis of the limb, the traction cord will at first be oblique.

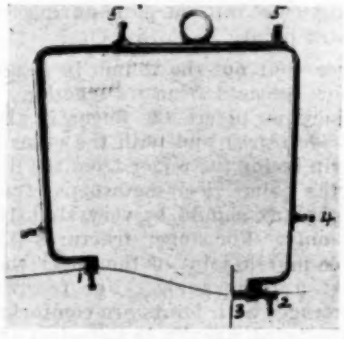

FIGURE XLVIII.

The same with Kirschner's wire. For a straight pull with Kirschner's wire see Figure XXII.

If the loop of the stirrup lies in the axis of the short fragment, whether the arms be unequal or not, the traction will result in a straight fragment [Figure XLII, (2)]. But in practice, a further X ray examination would be needed to determine

this point alone, and even then doubt would exist with any but a long fragment.

In practice the means for correcting oblique displacement by the adjustable stirrup are easily deter-

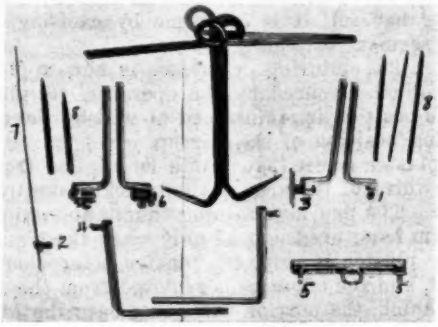

FIGURE XLIX.

All accessories: 1, set-screw to clamp wire prior to tightening; 2, set-screw clamped to wire, free to rotate with it; 3, hollow screw to tighten wire; 4, set-screw for adjusting length of arms; 5, set-screws for adjusting lateral deviation of loop; 6, hollow cylinders, clamping to pin and free to rotate with it; 7, Kirschner's wire; 8, varying gauges and lengths of pin.

mined by the following rule: either displace the loop, which is distal in the stirrup to the side to which the distal end of the fragment projects [Figure XLII, (4)], or lengthen the arm, which is proximal in the stirrup, on the side to which the proximal end of the fragment projects, or, if required, both [Figure XLII, (6)].

4. Besides being adjustable for length, the feet are made to curve in sharply just above the attachment to wire or pin. This allows a greater space between the arms of the stirrup and the side of the limb, greatly facilitating application of plaster.

5. For the pin the method of attachment to the stirrup adopted has been that standardized by Böhler (Figure XLVII). For the wire, tightening is effected by the simple device of a screw, rotating in one foot, the screw being tunnelled for the wire (Figure XLVIII). When the screw is turned, it carries the fixed end of the wire further out beyond the foot, so pulling the feet towards each other and using the resistance of the spring steel arm to increase the tension of the wire. For the hook (Figure XLVI) the arms are made in one piece, and for lateral adjustment one relies on sliding the traction loop off centre or on using the lateral loops as in Corlette's method. The reason is that hooks are commonly used above ankle and knee joints, and slight neglect to tighten the set-screws might result in loss of firmness. The results of scoring a knee joint are so tragic that it is thought better to rely entirely on the traction loops for adjustment of line of pull. It remains, of course, adjustable for width of the "bite".

Summary of Advantages Claimed for the Stirrup.

1. It obviates the need for a range of sizes.
2. It can be used for wire, pin or hook by substituting different feet.
3. It is easier of adjustment in position to the wire or pin.
4. It allows even traction on an oblique pin or wire or on obliquely placed hooks.
5. It can be used to reduce accurately the obliquity of a displaced short fragment.
6. It allows more room for application of plaster.

A New Method of Reducing Difficult Fractures of the Forearm or Dislocations of the Carpal Bones.

General Considerations.

Displaced fractures of the shafts of both bones of the forearm, either simple or compound, are notoriously difficult of either reduction or retention.

The most efficient method of retention in the worst cases seems to be by the application of plaster to the skin. Length and alignment are thereby maintained. But it is usually necessary to extend the plaster at least part of the way up the arm, and also to the knuckles on the dorsum of the hand and to the palmar crease on the volar aspect. Even with this form of retention, pins or wires through the correctly reduced bones and incorporated in the plaster are at times found necessary.

A method of reduction which relies upon manual traction through thumb and fingers by an assistant is liable to human error, especially when the assistant's muscles tire.

Only the thumb and fingers are available for traction, as the hand must be kept free for plaster application. In practice it is found to be remarkably difficult to hold the fragments firmly for any considerable length of time.

The services of a trained or even of an untrained assistant, who must be strong, intelligent and not upset by surgical manipulations, are often not obtainable without delay and expense.

FIGURE L.

Illustrating the method of exercising the shoulder joint without disturbing continuous traction on the arm in ambulatory treatment. Patient supine during the exercise.

When the arm is held by a band attached to the wall, a slight movement of the patient up or down the table destroys the right angle at the elbow, necessary to prevent the band slipping or pressing at either edge.

Description of Method.

A method is here described and illustrated which, it is suggested, overcomes these difficulties. Briefly, it consists in screw traction from a Steinmann's pin, held in the flexed phalanges by adhesive plaster, countertraction being obtained from a band from the limbs of the traction frame over the arm (Figure XIII).

The method of application of the adhesive is all-important. Reference to the illustrations will make the following points clear.

1. The fracture lines having been anæsthetized and the limb examined by X rays in two planes, the universal splint is adjusted to form a rectangle and stood upon end with the traction screw uppermost (Figure XII).

2. The hand is prepared for traction as follows: A Steinmann's pin is placed within the flexed phalanges, with the knuckle joints extended. Adhesive is attached, proximal to the pin, the proximal and distal phalanges being held close together, but without obstruction of the circulation. After the first layer of adhesive is fixed, a felt pad, about one and a half inches by one inch by a quarter of an inch thick, is laid over the terminal phalanges of the ring and middle fingers to compensate for their greater flexion, and is bound in place by a similar strip of adhesive (Figure XLIII). Several figure-of-eight turns with adhesive are now taken over the knuckles and phalanges and around the ends of the pin. They do not need to be tight.

To maintain the necessary abduction of the thumb a pad is placed between the index finger and thumb and adhesive plaster is applied from over the third and fourth knuckles, over the flexed fingers, thenar eminence and first metacarpal onto the lower dorsal surface of the forearm (Figure XLIV). This manœuvre greatly increases the firmness of the grip on the pin and enables a pull to be made at will, either evenly or on the radial or ulnar side.

The stirrup is now attached to the ends of the pin and fixed with an intervening spring (preferably a spring scales to register the pull) to the screw of the screw traction. The prepared splint frame is supported at a suitable level at the side of the bed or table. The suitable level is that which allows the abducted horizontal arm to swing a few inches above the base of the frame, so that plaster is easily applied to the dorsum of the arm, that is, the table or box supporting the frame is some six inches lower than the patient's shoulders. A pillow under the shoulder of the affected side, with both patient and frame on the kitchen table, is quite effective in the home.

A four-inch band of webbing, calico or adhesive plaster is passed over a pad on the arm close to the elbow flexure and around the two horizontal limbs of the frame, which act as a spreader (Figure XIII).

The screw is now tightened until sufficient elongation is obtained to permit reduction by manipulation and by the lateral thrust of the elongated muscles. Over-extension followed by relaxation is usually necessary.

A gap between the ends of the bones is avoided by X ray confirmation and by slight relaxation after the first full extension. If discovered after the plaster has set, it is overcome by excising a circular segment of plaster.

Retentive splinting or plaster is now applied by the method favoured by the operator. Supination or mid-position is maintained at will by the corresponding position of the stirrup.

If plaster is used, it should be applied from the upper third of the arm to the knuckles and palmar crease. The pad maintaining thumb abduction and the arm band are removed only when the remainder of the plaster is firm, the plaster being then completed, and the adhesive is removed from the fingers and thumb, the portion extending onto the forearm being left in position.

Advantages Claimed for the Method.

1. It eliminates the need for assistance.
2. The patient being supine, the shoulder cannot move relatively to the axis of traction and so cause the arm band to slip.
3. The forearm being vertical during plaster fixation, there is no tendency to bowing in the middle owing to gravity, and the natural curve open to the volar surface of both bones can be the more easily reproduced by the surgeon.
4. No special apparatus, pulleys, fixation of table *et cetera* are needed other than the universal splint frame.
5. A steady, even pull is exerted, controlled and registered by the spring balance and maintained until the plaster has set.
6. The pull being from a pin anterior to the proximal phalanges, dorsiflexion of the hand is maintained throughout (Figure XLV).
7. By using the adjustable stirrup, pull can be concentrated on the ulna or radius as required, while pronation or supination is controlled by tying the stirrup by a thread in the required position.
8. It is independent of injury to the thumb.

Limitations of the Method.

1. As in manual traction, this method is not available in the presence of severe concurrent injury of the fingers. But, unlike manual traction, it is independent of injury to the thumb.
2. It is not available in the presence of gross œdema preventing flexion beyond a right angle of the fingers. But the volar strap of adhesive from knuckles to thumb base gives security even with considerable œdema.

A New Method of Active Exercise of the Shoulder while the Arm is in Continuous Extension.

Severe injuries around the shoulder or elbow joint which necessitate mechanical reduction and continuous traction are well treated in bed by Corlette's method (Figures VIII and IX). Even with this method a wide range of movement is not

possible at the shoulder joint, as the traction cord becomes oblique relatively to the axis of the splint and the pull in the axis of the splint is immediately lessened. This is not of great moment, however, as even a small range of movement maintains nutrition and fair mobility.

But reasons concerning business, travel, expense *et cetera* may make ambulatory treatment desirable or necessary. Figure L illustrates a method which allows a wide range of abduction exercises in such cases. The traction is taken from the arm in the usual way by adhesive on the skin or on the plaster cast, attached to a cord. The cord passes over the evenly placed pulleys to a turnbuckle and spring scales, which are hooked into a sliding ring on the rod that supports the arm-piece. The ring is placed in such a position that the traction cord is in a straight line from the pulley to the shoulder joint and is clamped there (about three-quarters of an inch below the arm-piece as made). Exercise is carried out only with the patient supine—an important point.

This placement and method were arrived at after considering the following facts: (i) All methods in which weight and pulley or spring traction were used with the patient vertical were found to disturb the fracture, although the pull registered in the axis of the limb was constant. The reason is that the weight of the limb is an active factor, in spite of the tightest bandaging, and is added to the pull below the horizontal, but subtracted from it above the horizontal. (ii) In movements of abduction in any abduction frame the limb moves slightly along the frame, distally as the arm rises, proximally as it falls, because the patient's shoulder joint is necessarily higher than that of the splint. It was necessary, therefore, to find a point below the frame which moved correspondingly inwards relatively to the frame as the arm moved outwards upon it.

Advantages Claimed for the Method.

1. It allows active movement at a relatively early stage in injuries near the shoulder joint while the limb is still in continuous traction.

2. It allows active movement at the shoulder from the outset for injuries near the elbow joint without disturbing the fracture or the traction.

A New Method of Transporting Patients while under Treatment by Continuous Extension of the Lower Limb.

The transport of a patient with a fractured femur during treatment by continuous extension, and to a less degree of a patient with a fractured leg in extension, has always presented a difficult problem. The bent Thomas splint, with weight traction is one solution; but this means a double transfer of splints, does not prevent movements at the hip, is liable to cause rotation, even with foot support, does not provide abduction, and inevitably involves disturbance of the fracture line. A solution is here offered and illustrated (Figures XXVII and XXVIII).

Transfer to the Splint Frame.

First, the perineal post is fitted to the frame and padded (compare Figure XVIII). If the patient is already being nursed in the splint frame resting on the bed, the frame is then simply allowed to settle firmly against the perineum before he is transferred to the stretcher. (The cords are shortened so that the weights hang above bed-level and, therefore, stretcher-level.)

If the patient is in a Hodgen type of splint in a Balkan frame, the perineal post is fitted into the perineum as before and the splint frame (*minus* its overhead pulleys) is placed below the Hodgen splint. The uprights of the frame embrace the lower end of the Hodgen splint and the adjustable Böhler type pulley attachment, carrying three pulleys, is now fitted into the upper ends of the uprights to carry the extension. A second traction cord is tied to the stirrup or spreader already in use for traction. This is carried over the pulleys and the required weights are attached to the free end. If the full weight is added at once, there will be double traction, so that it is advisable to have the weights attachable five pounds at a time while the weight on the existing traction cord is correspondingly reduced.

The Hodgen splint, with its contained limb, has now settled down onto the splint frame and the limb is still in extension, but over the pulleys of the splint frame. The Hodgen splint may be removed, but it is easier to leave it there for transfer into the new Balkan frame prepared in the home or hospital, or into the original frame after X ray examination. Counter-pressure to the traction is borne by the perineal post, and abduction is maintained by the adjustable hand, the rods being longer than the width of the stretcher.

Transfer of Patient in the Frame to the Stretcher.

If the patient was previously suspended in a Balkan frame, it would be advisable to place the stretcher beneath him before transferring the limb into the splint frame. It is then only necessary to strap the adjustable hand and its rods to each side of the stretcher for stability and to slip the board (*quod vide*) beneath the pelvis and thigh (if the stretcher is of the canvas type) for stability of the base of the frame.

If the patient's frame is already on the bed, it is difficult to lift him onto the solid type of stretcher in standard use in Sydney. An ordinary canvas stretcher is therefore used with a board, twenty-four by eighteen inches, to cross the stretcher under the patient's buttocks. This board has twin holes at each corner to enable a cord to fix it on the stretcher against slipping. The rolled canvas without poles is unrolled under the patient from foot to head. The board is slipped under the buttocks and base of the frame. The poles are now inserted in the canvas, the universal hand and the board are both tied to the stretcher at either side, and the patient is ready for transport (Figure XXVII)

The use of weights has been described, being quite satisfactory for city travelling; but for rough travel the traction loop, with its screw and spring scales, would be better, the weight of pull being registered on the spring scales and swinging of the weights being avoided.

The whole transfer from Balkan frame to stretcher takes about ten minutes and requires, in addition to the universal splint frame, only the board and some cord and adhesive strapping.

A New Method of Reducing Fracture Dislocations of the Cervical Spine.

General Considerations.

In considering immediate reduction of a cervical fracture dislocation the following considerations apply:

1. It is not known at the outset whether paralysis, if present, is due to irreparable damage to the cord or to pressure from bone, from blood, or from œdema, or from so-called spinal concussion.

2. With nerve tissue, even more than others, temporary obstruction of the circulation quickly results in permanent damage.

3. It is an axiom in all fractures and dislocations that the most effective treatment for the reflex spasmodic contraction of muscles and the most effective preventive of further hæmorrhage and œdema is anatomical replacement of parts.

4. Manual reduction of cervical fracture dislocations with the aid of a Glisson's sling and a body belt for traction, has proved to be both uncertain and hazardous.

5. Continuous traction in bed by the Glisson's sling, by weight and pulley, is rarely effective, the patient is in pain and is restless, and aggravation of pressure or of effusion of blood may occur.

6. If the cord is only compressed and not crushed, paralysis may rapidly disappear on relief of pressure.

7. There is no reasonable hope of obtaining a flexible or painless cervical spine in the presence of an unreduced fracture or dislocation, even in the absence of paralysis.

8. The main bars to reduction have been (*a*) the fear of involuntary movements on the part of the patient or of the surgeon or necessary assistant, especially when the muscles tire; (*b*) the difficulty of palpating and manipulating the fracture while straining to extend the spine; (*c*) the great force often necessary to extend the head sufficiently to clear the edges of the interlocked articular processes; (*d*) the need to entrust to an assistant (even with the use of block and tackle) either manipulation or traction.

My personal experience has been confined to the older methods with unsatisfactory results. But the foregoing considerations certainly indicate early reduction, if a safe method is evolved.

The following is suggested from experience with mechanical reduction of other fractures and of spinal fractures with local anæsthesia.

Method of Reduction.

The adjustable shoulder-pieces (Figure IV) are slipped on the uprights of the lower limb splint or other traction frame (Figure XXI). The apparatus, including the Glisson's sling, is thoroughly tested for a 100-pound pull (50 pounds should suffice in any recent case), and a preliminary injection of morphine is given. The site of fracture is injected with "Novocain" (20 cubic centimetres of 0·5% solution) between the affected spinous processes and at the site of maximum tenderness.

The well-padded Glisson's sling is adjusted to the patient's head. The patient is placed carefully on the adjustable back support with removable head-rest (Figure XXI), the reduction frame is placed over the head, and the shoulders are adjusted to the shoulder-pieces. The screw traction is linked by wire or stout cord (previously tested) to the spring balance, which is hooked into the metal stirrup of the Glisson's sling.

The screw is now very gradually tightened, some minutes being taken. The human element in traction is thereby avoided and the force of traction is registered on the balance. The patient's head is firmly held and supported, and the surgeon is free to undertake palpation and manipulation. It should rarely be necessary to press the prominent lower spinous process forwards, as the tension of the prevertebral and post-vertebral muscles should cause the vertebræ to slip into line once the interlocked articular processes are released (Böhler). As the interlocking is due to a prominence of not more than one-fifth of an inch, harmful elongation of the neck is not needed and the local anæsthesia should reduce the muscle spasm.

When the vertebræ are felt by palpation to slip into place, tension is partly relaxed and the neck is examined by X rays in two planes. When the position is satisfactory, the head is freed from the traction apparatus; it is allowed to remain on the adjustable head support, while plaster is applied to the head, neck and chest with the chin elevated.

Summary of Theoretical Advantages Claimed.

1. Absolutely steady and continuous pull by the screw traction eliminates the human element.

2. The head and trunk are supported throughout by the adjustable trunk and head support.

3. The force of the pull is registered by the spring balance and can be varied at will.

4. Examination and manipulation are carried out by the surgeon alone, freed of any other preoccupation.

5. X ray examination in two planes is possible while the screw traction maintains the position.

Summary.

Three new splint frames are described, which have been designed so that there shall be a joint corresponding to each joint of the limbs, and so that each joint may be fixed or moved independently of the others. The lengths of limb parts are also adjustable

to the corresponding lengths in the patient. It is claimed that with these three splint frames, an adjustable traction stirrup, ordinary materials, such as plaster and adhesive, and the necessary skill, the practitioner has available the means of dealing promptly and efficiently, either in the home or hospital, with any fracture of the limbs by the most modern methods at any stage from first setting preliminary to transport, through mechanical reduction and nursing, to the mobilization of stiff joints or contractures of soft parts.

In addition, methods are described, which are believed to be new, of reducing fractures or dislocations of the neck, forearm, wrist and hand, of transporting both upper and lower limbs during treatment by continuous extension, of extending fractured limbs during open operation, and of adjusting the line of pull by a tractor on a deviated short fragment in order to straighten it.

All the apparatus may be taken apart, stored or carried, together with an adequate first supply of materials, in a suit-case, and should cost complete not more than £A40.

ACKNOWLEDGEMENT.

I am indebted to Mr. Arthur Cruwys, of 45, Merton Street, Rozelle, New South Wales, not only for constructing all the splints, but also for devising the mechanical details for implementing the plans submitted to him. In one matter, the screw reduction of dislocated neck, I am indebted to him for the suggestion as well as the construction. To the chief engineer at Sydney Hospital I am also indebted for the construction of earlier models of the adjustable stirrup.

Reports of Cases.

HERPES ZOSTER WITH METEORISM.

By R. ERROL MAFFEY,

Singleton, New South Wales.

ON October 30, 1936, I was called to see a woman, aged sixty-eight years, a visitor from another town, who complained of severe pain in the right flank, aggravated by movement, and of two days' duration. She had vomited once since the onset of pain, but had no other symptoms of relevance. In her past history the points of note were the "holes in the lungs" (? bronchiectasis) left by several attacks of bronchitis, the fact that tonsillectomy and antrostomy had been performed five years previously, and that the patient had a "weak stomach for doctor's medicine". Physical examination revealed a temperature of 37·25° C. (99° F.), a pulse rate of 80 per minute, and a clean, moist tongue; the heart and chest were apparently normal. The abdomen was soft and flaccid, and no tenderness or other abnormality was detected by palpation and percussion. A few slightly raised red macules were noticed, covering an area of skin about the size of a florin and situated at the level of and one inch to the right of the umbilicus. This rash had not been noticed previously by the patient and was not painful. Slight tenderness of the muscles was found in the mid-axillary line, between the right costal margin and the iliac crest. The result of urinalysis was normal. A mixture containing sodium salicylate was prescribed, but the "weak stomach" rejected it.

I saw the patient again on November 2, 1936. She felt no better and a profuse herpetic eruption had appeared on the right side of the body, in the areas of the cutaneous distribution of the ninth, tenth and eleventh thoracic segments of the spinal cord. As the patient was staying with comparative strangers, I arranged her admission to hospital for a few days. In accordance with a suggestion[1] read recently, I gave her an injection of 0·5 cubic centimetre of pituitrin on two consecutive days with the object of relieving the herpetic pain. On November 4, 1936, the patient was very well, having lost all pain, though the skin eruption was unchanged. She was to have left hospital on the next day, but early in the morning developed great distension of the abdomen, without pain and with little discomfort apart from the frequent belching of wind; there was no vomiting. The bowels had been well opened on the previous day. The patient's general condition was excellent and no alteration had occurred in her temperature and pulse chart. The abdomen was uniformly distended, not tender on palpation, tympanitic and very silent on auscultation. The hernial orifices were clear. It was decided that no mechanical obstruction of the bowel was present, and 1·0 cubic centimetre of pituitrin was given intramuscularly, together with a soap-suds enema. Neither fæces nor flatus was passed, so a turpentine enema was administered, but still without result. Distension had increased and the patient was now very uncomfortable. Two further injections of pituitrin were given, and later a further turpentine enema, which this time resulted in the passage of a small amount of flatus, followed in twenty minutes by a formed motion of moderate size. The patient now felt easier, but the abdomen was still very distended. Three grains (0·195 gramme) of calomel were given at night and a dose of magnesium sulphate and an injection of pitressin in the morning. This produced a liquid motion and flatus. The abdomen was then much softer and appeared to be somewhat fuller along the left side than the right. Signs of intermittent peristalsis were detected on auscultation. Some pain was complained of in the right flank. It was not until November 11, 1936, that all signs of distension disappeared, and the bowels opened without the aid of acetylcholine, pitressin, pituitrin, enemata or aperients. The rash had faded somewhat, but was still fairly thick. The patient was discharged from hospital on November 14, 1936.

During my absence on holidays this patient was readmitted to hospital on November 19, 1936, by my partner, Dr. Gordon, because of severe post-herpetic neuralgia, which proved very intractable.

Comment.

Samson Wright, in describing the sympathetic nervous system,[2] states that the connector cells for the abdominal organs lie between the sixth thoracic and second lumbar vertebræ. The connector fibres reach the lateral sympathetic chain in the usual way via the white rami. They do not relay, however, in the ganglia of the lateral sympathetic chain, but continue through them as the splanchnic nerves. Electrical stimulation of the splanchnic nerves results in inhibition of the peristaltic movements of the wall of the gut and diminution of its tone. The sphincter musculature is stimulated and the sphincters become tightly closed.

In *herpes zoster*,[3] noxious influences, such as inflammation, hæmorrhage, pressure or poisons, act on the posterior root ganglia or their cranial homologues. The lesions are equivalent to stimulation of the ganglion, and so dilatation of the blood vessels in the corresponding skin area occurs. The "H" substance (resembling histamine) which is liberated by stimulation of the dilator fibres, not only dilates the minute vessels, but also increases their permeability. This leads to exudation of serum and formation

of vesicles in groups along the distribution of the posterior nerve roots or their cutaneous sensory branches. The apparent explanation of the case detailed above is that the noxious influence acting on the posterior root ganglia did not stop at stimulation of the dilator fibres in the corresponding skin area, but also caused stimulation of the splanchnic nerve fibres arising from the same ganglia. This caused inhibition of peristalsis and spasm of the sphincter musculature of the gut, leading to the meteorism observed.

References.

(1) F. H. Gillett: "Pain of Herpes Zoster Treated with Pituitrin", *The Lancet*, August 11, 1934, page 307.
(2) Samson Wright: "Applied Physiology", Third Edition, page 126.
(3) *Ibidem*, page 38.

Reviews.

MATERIA MEDICA AND THERAPEUTICS.

PREVIOUS editions of "A Treatise on Materia Medica and Therapeutics", by R. Ghosh, have been very favourably reviewed in THE MEDICAL JOURNAL OF AUSTRALIA, and the fourteenth edition is of the same excellence.[1] Doubtless a further edition will be required in the near future to incorporate the additions included in the 1936 Addenum to the British Pharmacopœia. The general arrangement of the book has been somewhat altered. Iron is considered with liver extract and desiccated stomach under "Drugs Acting on the Blood". Quinine and other anti-malarial remedies; mercury, bismuth, arsenic and iodides; antimony and the amœbicidal remedies are grouped together under "Chemotherapeutic Agents". A description of the reticulo-endothelial system precedes the account of chemotherapeutic agents. Extensive revision has been made of iron, general anæsthetics, opium, barbiturates, digitalis, anterior pituitary, ergot, quinine and the vitamins. New drugs or preparations included in the latest edition are as follow: Thallium acetate as a depilatory. Caution in its use is urged on account of the liability of toxic symptoms arising. "Myocrisin" (sodium aurothiomalate) and other gold preparations are fully but temperately described. Of "Solganol-B" it is said that unless the dose is regulated carefully severe reaction may follow and the condition (tuberculosis) be made worse. "Dicodide" (dihydrocodeinone acid tartrate), "Dilaudide" (hydrochloride of dihydromorphine) and "Eukodal" (hydrochloride of dihydroxycodeinone) are not used to any extent, if at all, in Australia. "Dilaudide" is said to be less liable to form a habit than is morphine. "Eukodal", on the other hand, though prepared from a non-habit-forming drug is stated to be prone to produce addiction. It must not be forgotten, however, that codeine may produce addiction, although such addiction is very rare. The newer barbiturates, "Evipan", "Sodium Evipan" and "Soneryl Sodium" are considered. Of the last mentioned it is stated that no complication has been recorded other than some depression of breathing in a few instances. Bulbocapnine and harmine (banisterine) are vegetable alkaloids, the former being used for the relief of the tremors associated with chorea, multiple sclerosis, *paralysis agitans* and encephalitis. The latter is stated to be useful in post-encephalitic Parkinsonism. However, it must be said that neither is reliable. In fact, it is doubtful if either is of definite benefit. "Percaine" is stated to be three times more toxic than cocaine, but its minimal effective concentration is about one-fortieth that of cocaine. "Gavano" is mono-methyl ester of cephaëline, not cephæline, as erroneously spelled in the text. It is used in chronic intestinal amœbiasis. "Coramine" and "Carditone" are included, as is also manganese butyrate, which is of use in staphylococcal, streptococcal and gonococcal infections. Of "Synthalin" it is said that, although extolled by some, the results have not been uniform. "Neptal" is a complex organic mercurial compound acting similarly to "Salyrgan". "Carbarsone" is an arsonic acid compound, and "Vioform" is iodochlorhydroxyquinoline. Both are amœbicidal remedies. Pertussis vaccine is included as well as anti-venom sera, mention being made of that employed in Australia.

One can only repeat that the book is a mine of information and that the statements relative to the uses of drugs are made temperately. It is a book of the greatest value to student and practitioner alike.

[1] "A Treatise on Materia Medica and Therapeutics, including Pharmacy, Dispensing, Pharmacology and Administration of Drugs", by R. Ghosh; Fourteenth Edition by B. N. Ghosh, F.R.F.P. and S.; 1936. Calcutta: Hilton and Company. Demy 8vo, pp. 789, with illustrations. Price: 12s. 6d. net.

PÆDIATRICS.

THERE have been within the last year or two a number of important publications on pædiatrics. The latest one, by Wilfred Sheldon, on "Diseases of Infancy and Childhood", should be assured of a welcome.[1] The author states in his preface that he aimed at writing a book that would be more than a handbook, but would in no sense compete with the larger works of reference on children's diseases. It represents his clinical teaching and lectures on pædiatrics to students and post-graduates at King's College Hospital, London.

It is a physician's book, and so we find, as is only natural in the circumstances, that details of surgical treatment are omitted, while frankly surgical conditions, such as osteomyelitis, cleft lip and palate, *et cetera* are excluded altogether.

The material is divided up into systems in the conventional text-book way. Most of the rare and obscure conditions are included because, as the author justly says, "we never know when we will meet them, and their recognition is an unfailing source of stimulation and satisfaction". The sections on these rarer conditions are short, but the essentials are caught. In dealing with the more commonplace conditions ample space is given for a concise and up-to-date presentation of London teaching. The chapters on infant feeding and disorders of nutrition embody the usual conservative London outlook and will not satisfy the specialist.

There are useful lists of percentages and information about proprietary foods of all types. These are evidently prescribed a good deal more in England than they are here. It is stated that all the dried milks can be diluted (one drachm of powder to one ounce of water) to get an approximate reconstitution of milk. This is a loose and inaccurate way of generalizing and cannot be taken too seriously. If one knows the composition of these dried foods and the weight of a measure, it is a simple matter, with a little practice, to order one's own dilutions independently of the directions on the tin, which are by no means generally applicable.

There is the usual reluctance to add early enough to the infant's diet cereals, broth, vegetables *et cetera*, although one gathers that London opinion may be gradually changing in this respect—a change which occurred long since in America and on the Continent.

It must be allowed that the author in this book successfully accomplishes what he sets out to do. It is well indexed, well printed and easy to read. Recipes and references to recent articles are included as footnotes. Prescriptions are freely used throughout the text. The illustrations, though rather sparse, are adequate and well produced.

Dr. Sheldon's book should be welcomed by students and general practitioners, who will find it a thoroughly practical, useful and up-to-date compendium, well worthy of a place on their shelves.

[1] "Diseases of Infancy and Childhood", by W. Sheldon, M.D., F.R.C.P., with a foreword by G. F. Still, M.A., M.D., LL.D., F.R.C.P.; 1936. London: J. and A. Churchill Limited. Demy 8vo, pp. 748, with 137 illustrations. Price: 21s. net.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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MEDICINE AND SCIENCE.

To what extent medicine is a science, to what extent an art, is a question that is often discussed. Medical knowledge, it is true, is scientific, for it is "knowledge acquired and tested in accordance with a special mental discipline"—it is knowledge based on facts which can be proved by appropriate technique. Yet medicine is not and never can be wholly a science; the successful practice of medicine—the application of medical knowledge to the problems of the health of the individual—is in great degree an art. Alexis Carrel put the matter well when he wrote that physicians had to use the spirit and methods of science, but that they had at the same time to take into account the nature of man, his unity and his uniqueness. In much that is written on this subject medical practitioners are exhorted to study the personality of the patient as well as his disease, to regard disease as a personal event, for it "consists of the individual himself" and "there are as many different diseases as patients". On this occasion we would emphasize the scientific basis of medicine and the need for a wide scientific outlook. Medicine after all is not a science in its own right, for its stability depends on the basic sciences of physics and chemistry and on their special developments of biology and physiology. Other sciences also bear important relationships to some aspects of modern medicine: agriculture can be viewed from the standpoint of human nutrition, and sociology and economics in their influence on preventive medicine. Directly and indirectly the scientific implications of medicine are of the widest range and interest.

The meeting of the Australian and New Zealand Association for the Advancement of Science, held recently at Auckland and reported in this issue, had as its dominant purpose the furtherance of research—the pursuit of knowledge for its own sake and its application to the problems of mankind. Scientific enterprise is continually and rapidly expanding, but at the same time the increasing growth of specialization in science, the division and subdivision of the field, has narrowed the scope of the individual investigations contributing to scientific progress. Encyclopædic knowledge of all the ramifications of modern science is not possible, for the "scientific state", discussed by Sir David Rivett in his president's address, consists of many fields, all being actively exploited. The ideal for the investigator is that he should become expert in the affairs of his own particular field and have some knowledge of what is taking place on his neighbours' plots. The Australian and New Zealand Association for the Advancement of Science, like the British Association which inspired its origin, does a valuable service in linking up the various branches of science, and the biennial meetings provide an opportunity for workers to compare notes and to orientate their endeavours.

In many universities there exist clubs devoted to the medical sciences, in which teachers and research workers discuss the problems of medicine, physiology, pathology, bacteriology and cognate sciences. In these clubs consideration is given not primarily to clinical medicine, but to the underlying scientific principles of medicine. In the Section of Medical Science and National Health at the meetings of the Australian and New Zealand Association for the Advancement of Science medicine is viewed from the biological standpoint and also as a sociological study, the application of medical knowledge to the

welfare of the community. Congresses of scientific societies provide an opportunity for recording progress, ventilating ideas, formulating programmes, and cultivating ideals. The same function is fulfilled by our own Australasian Medical Congresses, and it is opportune to remind members of the British Medical Association of the congress to be held at Adelaide in August next. If medicine is to maintain its dignity as a science, its teachers and practitioners must keep themselves informed of the advances being made in the cultivation of the whole scientific estate. Only with such an outlook can medical practitioners derive the greatest interest from their work, serve their patients best, and confer lasting benefits on the community.

Current Comment.

POSTURE IN RELATION TO OBESITY AND EMPHYSEMA.

THE treatment of obesity is very much in the forefront of both lay and professional interest today, but probably not sufficient attention is paid to the evil effects arising from the local deposition of fat in and about the abdominal cavity. It is not only important that the person may carry too much weight, but it is essential to realize that a central distribution of this weight produces an undesirable posture and helps to reduce the vital capacity and thus to lower the cardiac and respiratory reserves. J. W. Kerr and J. B. Lagen[1] have done some constructive work on this particular type of obesity and regard the postural syndrome to which it gives rise as one of the most important of those seen in the practice of medicine. They remark that during the symptomless stage of accumulation of adipose tissue in the third decade of life the only change which calls for comment is an increasing girth, but that during the next decade a degree of breathlessness on exertion and not infrequently of lumbo-sacral strain are noted, which are out of proportion to what might be expected from purely degenerative causes. The normal spinal curves are accentuated and the additional abdominal fat throws the centre of gravity forward. Kerr and Lagen remark that at this stage symptoms may arise which will cause the patient to consult all manners of medical men, including the physician, the orthopædist, the neurologist and the gynæcologist. They remark that postural training can minimize the physical strain involved by these changes only to some extent, but by the time the fifth decade is reached the problem is still more difficult; exercise and even average activity are curtailed, food may be taken in excess of actual requirements, and the onset of presenile degeneration causes progressive slackening of muscles and ligaments. In fact, as the girth increases, the prospect of decreasing it and its attendant disabilities steadily lessens. The authors go into some detail with regard to the mechanics of posture and of respiration, a knowledge of which should be applied to the examination of all patients whose physical state is in any way relevant. The evil effects are briefly as follows: The increasing pull on the lumbar spine results in a thoracic kyphosis and a cervical lordosis, the sacrum may increase its angle of 45° to 60° of the lumbar spine to 90° or more, and a certain amount of bending of the knees may even occur in the attempt to compensate for the increase in the spinal curves. A point of some importance made by the authors is that when a patient suffering from spondylitis with some nerve root irritation acquires excessive fat in the abdominal cavity, the resultant changes in his posture may make his neuritic symptoms very much worse. The thoracic kyphosis is, however, the most important of all the changes, on account of its effect upon respiratory function. Reference was made in these pages some time ago to the value of an abdominal belt in the relief of emphysema, and Kerr and Lagen present evidence in favour of this form of treatment in their present article. The increase in the degree of curving in the thoracic spine produces an elevation of the ribs and thus the well-known barrel chest appears; the lower ribs are directed down and the diaphragm leaflets are widened and flattened. Hence arises the interesting fact that persons with this disability are able to breathe more easily when lying flat, and thus they suffer from orthostatic dyspnœa; the chest is, of course, more or less fixed in the inspiratory phase and there is a great reduction in pulmonary ventilation, which may even result in polycythæmia in advanced cases. The frequency of hypertension in such subjects would, of course, make things much worse.

The importance of the recognition of this syndrome lies in the fact that people in their fifties and sixties may suffer from such symptoms as respiratory and circulatory embarrassment, spondylitis, or one of the many vareties of muscular or ligamentous strain, and that the place of the postural syndrome in the clinical picture may readily be overlooked. In particular the examination of such a patient only when in bed may give a misleading or at least incomplete idea of the situation. Kerr and Lagen justly say that with advancing years it is not always easy to disentangle all the factors which may complicate and confuse diagnosis; still it would be wise always to take heed of those physical defects which may be capable of some improvement. As regards treatment, prophylaxis is of course important, but it is difficult to carry out, as it is only too easy to disregard the simple rules of posture, exercise and diet. Excess weight should, of course, be removed to that extent which is safe and readily possible. Postural exercises may be carried out with a view of

[1] *Annals of Internal Medicine*, November, 1936.

strengthening the abdominal muscles and cultivating correct stance, though it is feared that most middle-aged patients who have acquired a soft and easy manner of living soon grow weary of well-doing in this regard. The most practical suggestion is the wearing of an elastic belt. A properly devised belt helps to straighten out the spinal curves and move the centre of gravity backwards and to relieve the strain of respiration. There are three elements in the belt which they advise: a firm support over the back; a strong but not over-thick front with multiple straps, including one semi-elastic strap at the side to give the necessary uplift; and side sections consisting of elastic. Such a support they have found of distinct benefit to numbers of patients. It is probable that more care and discrimination should be used in the treatment of obese patients of the type mentioned, and in particular it should be remembered that postural training and exercises are of much more value to a patient who has had some of his excess weight reduced than to one whose over-weighty and pendulous abdomen continually interferes with adequate respiratory movements.

SYPHILIS.

SYPHILIS is endemic in almost every country, perhaps every country. The name "endemic syphilis", which has been applied to the disease on the Arabian peninsula, seems strange. The object, apparently, is to distinguish it from syphilis of venereal origin. In Bedouin communities there is little sexual promiscuity, and venereal disease is rare. Nevertheless syphilis (known locally as *bejel*) is endemic. It is usually acquired in childhood and is manifested in its earliest stages by a mucocutaneous eruption. Ellis H. Hudson has described the clinical and serological characteristics of *bejel* in various journals. These should be consulted by anyone seeking further enlightenment on the subject. The eradication of any widespread disease from a primitive community is difficult; it is especially difficult if the disease is chronic in its evolution and intermittent in its manifestations, as syphilis is. Ellis H. Hudson and Susan S. Crosby have recently recorded their experiences with intramuscular injections of bismuth in the treatment of *bejel*.[1] They state that 90% of people in villages in the region of Deir-ez-Zor, Syria, are syphilitic. Males and females are affected in equal numbers. "*Bejel* does not attack the constitution or the vital structures of the body, and is not transmitted congenitally." Hudson and Crosby point out the difficulties in the treatment of Bedouin patients. The patient often seems to be indifferent to the lesions. Most children are allowed to pass through the early stages without treatment, because it is generally believed that the disease terminates with the subsidence of the early manifestations. The Bedouin hates to be away from his village for long, and will seldom remain in town long enough to receive adequate treatment. He has a "hazy conception of all time intervals longer than the day" and will not attend regularly at longer intervals. Finally, the Bedouin villager is very poor and cannot afford to pay for much treatment, nor to be long away from his work. It is therefore impossible to treat these patients, without compulsion, on the lines usually followed in the treatment of syphilis. Hudson and Crosby question whether such treatment is necessary or desirable. The objective in the treatment of *bejel* is the eradication of the disease from the community rather than the cure of the individual; it is necessary, then, only "to control the infectiousness of individuals with open lesions". This can be done by the administration of bismuth alone, at a low cost, and in a manner suitable to the Bedouin temperament. Hudson and Crosby give an injection of 5·0 centigrammes of sodium bismuth tartrate in solution into the *gluteus maximus* muscle on one day, and 10·0 centigrammes of bismuth salicylate suspended in oil into the deltoid muscle the next day, and so on, alternately, over a period of eight to ten days, or longer if possible. During the years 1932 to 1935 they treated 1,000 patients by this means. In every case a "bismuth line" appeared on the gums; but there was seldom more than a mild gingivitis, and stomatitis was rare. The results on the whole were satisfactory. In almost every case there was improvement within twenty-four to forty-eight hours after the first injection, and improvement continued after the cessation of treatment. Presumably the early improvement was due to the quickly absorbed, quickly eliminated tartrate, and the later improvement to the slowly absorbed salicylate.

The difficulties in the treatment of the community for *bejel* appear in many respects similar to those encountered in places where framboesia is prevalent. The main difference is that framboesia is more readily curable. The major difficulty, getting the patients to attend for treatment, can be overcome by taking the treatment to the patients in their villages. This method is expensive, but will have to be adopted if *bejel* is to be eliminated. The benign characteristics of *bejel* and the fact that it is not transmitted congenitally suggest that it must be an ancient disease. This is something for discussion by medical historians.

[1] *The Journal of Tropical Medicine and Hygiene*, November 2, 1936.

NEWS FROM THE BRANCHES.

THE attention of readers is drawn to Victorian Branch news, published in this issue. We welcome the decision of the Victorian Branch Council to revive the custom of using the columns of THE MEDICAL JOURNAL OF AUSTRALIA for the dissemination of news amongst their members. A few years ago several of the Branches were accustomed to send to the journal short *résumés* of the activities of their councils. Gradually the custom fell into disuse. It is to be hoped that the action of the Victorian Branch Council will be followed by other Branches.

Abstracts from Current Medical Literature.

MORBID ANATOMY.

Hyperplastic Tuberculosis of the Stomach Causing Hour-Glass Deformity.

G. W. WATSON, E. R. FLINT AND M. J. STEWART (*The British Journal of Surgery*, October, 1936) report a case in which hyperplastic tuberculosis of the stomach gave rise to an hour-glass deformity with complete squamous metaplasia of the upper loculus. The hour-glass deformity was almost exactly in the middle of the stomach. The patient was a man, aged thirty-one years; he was transferred to a surgical ward with a diagnosis of carcinoma of the stomach, and operation was undertaken. The diagnosis was made on examination of the specimen. The authors point out that hour-glass stomach is nearly always due to cicatricial contraction in the floor of a large chronic peptic ulcer lying astride the lesser curvature. Occasionally a sclerosing carcinoma of slow evolution may produce a somewhat similar type of deformity. The lesion in the authors' case was granulomatous and in their opinion had the characters of hyperplastic tuberculosis. Tuberculosis of the stomach is rare. Tuberculous gastric ulcers are usually part of a widespread ulcerative process throughout the digestive tube. Occasionally they are due to tuberculous glands or peritoneal nodules that have ulcerated through the gastric wall. Hyperplastic tuberculosis is the rarest form of all. The authors came to the conclusion that the lesion in their case was probably primary. They draw attention to the squamous metaplasia of the upper loculus. The squamous differentiation stopped short at the stage of *stratum lucidum*. "Whether this is a genuine metaplasia due to the changed environment resulting from the mid-gastric obstruction, or whether it has arisen by squamous epithelial replacement extending down from the œsophagus, it is perhaps idle to speculate. The condition simulates closely the normal state of affairs in the stomach of rodents and some other animals, and might reasonably be designated 'rattisation' of the stomach."

Suprarenal Atrophy following Denervation.

A. M. SNELL, R. M. WILDER AND R. W. CRAGG (*The Journal of Pathology and Bacteriology*, November, 1936), writing from the Mayo Clinic, report a case of suprarenal atrophy following the operation of denervation, a case which, as they point out, constitutes the clinical counterpart of experimentally produced suprarenal atrophy. The patient was a medical practitioner, aged thirty-nine years, who gave a history of having suffered from peptic ulcer for nineteen years and of having on numerous occasions had profuse gastro-intestinal hæmorrhage. Fourteen years before he came under the care of the authors, he had a posterior gastro-enterostomy performed. At this operation multiple active duodenal ulcers were demonstrated. Eventually symptoms became so severe that in 1932 the operation of suprarenal denervation was performed. Some weeks after the operation signs of Addison's disease became apparent. He was admitted to the Mayo Clinic and came under the care of the authors after a severe hæmorrhage. After nineteen days the patient died, in spite of treatment, chiefly from exhaustion and suprarenal insufficiency. At autopsy both suprarenal glands were found to have atrophied to an extreme degree. Microscopic examination revealed only multiple adenomatous nodules of cortical cells, the normal architecture of the cortex being absent in all sections examined. The medulla was completely absent from all sections; the only remaining evidence of its previous existence was a small area of areolar connective tissue. The authors state that, so far as they are aware, this case is the first on record in which the suprarenal glands have been examined *post mortem* at a late date after the operation of denervation. They think that the condition represented a true example of Addison's disease due to suprarenal atrophy. They admit that observation of a single case does not permit them to offer an opinion as to the rationale of suprarenal denervation, its dangers, or its merits or demerits as a method of treatment. They point out, however, that possibly the operation may interfere with the blood supply of the cortex to a considerable extent and also that cortical tissue may be destroyed by the manipulation necessary to sever the nervous connexions of the gland. It would be safe to assume that there is a certain amount of latent suprarenal damage in every case in which the suprarenal glands are subjected to any surgical procedure.

Melanoma of the Rectum.

H. H. LINDNER AND W. Q. WOOD (*The British Journal of Surgery*, July, 1936) report the occurrence of a melanoma in the rectum of a woman fifty-three years of age. She had complained of pain in the rectum and of the passage of blood on defæcation for a period of four months. The tumour appeared as an indurated swelling, projecting into the lumen of the bowel at the level of the ano-rectal junction. The true nature of the specimen was recognized only in the routine examination of the specimen after its removal by surgical operation. The authors point out that a melanoma bulges into the lumen of the bowel; it shows no tendency to spread in an anular fashion. If it obstructs the bowel, as it may in the long run, it does so by occlusion and not by stenosis. The authors point out that the regional lymphatic glands were found on naked eye examination to contain pigment. They conclude that the cells containing pigment were not indicative of metastatic deposit, but of transference or ingestion of pigment by phagocytic cells. Though the patient was operated on in September, 1935, she was in good health in April, 1936. These tumours are very radio-sensitive and their dissemination may be delayed for a long time.

The Relation of Diet to Gastric Lesions in the Rat.

E. L. HOWES AND P. J. VIVIER (*The American Journal of Pathology*, September, 1936) have investigated the relationship of diet to the occurrence of hyperplastic and ulcerative lesions in the stomachs of rats. They find that hyperplasia, hyperkeratinization and ulceration of the squamous epithelium of the rumen of the rat's stomach result from an inadequacy of the diet. Similar lesions occur without keratinization in the glandular epithelium as well. Young rats are more sensitive to the inadequacy of the diet than adult rats are. An adequate intake of whole yeast prevents the formation of the lesions in both young and adult rats. Additional amounts of vitamin-free casein or cod-liver oil or other forms of vitamin *A* do not prevent the formation of the lesions. Ingestion of fæces prevents their occurrence. The authors refer to the work of other observers. They point out that Dalldorf and Kellog and Büchner have argued that peptic ulcer in man arises from conditions similar to those experimentally needed to produce the lesions in the stomach of the rat. At the same time others have advanced the hypothesis that the mechanisms involved are similar to those necessary to produce the gastritis that accompanies a gastric ulcer. The authors add that the latter view might possibly be correct, but that there is certainly no similarity between these lesions and peptic ulcer in man. These lesions are acute and multiple and the ulcerations occur not only in areas where the epithelium is hyperplastic, but in squamous epithelium as well. Patients with pellagra, however, have somewhat similar lesions in the squamous epithelium of the lower end of the œsophagus; hyperplasia can also be produced experimentally by dietary deficiency.

MORPHOLOGY.

Cervical Connective Tissue.

DONALD BARLOW (*Journal of Anatomy*, July, 1936) draws the following conclusions from an anatomical investigation into the cervical connective tissue carried out by dissection, by large serial sections and by injection experiments. Cervical connective tissue has an important influence in directing and limiting the spread of injected fluid. The retro-visceral space reaches from the skull well down into the posterior medi-

astinum and is limited laterally by condensations of connective tissue. Above the level of the hyoid it is strong laterally and does not communicate with the lateral pharyngeal space. It has no direct relationship to the tonsil, but contains lymph nodes draining the naso-pharynx. Below the level of the hyoid its lateral boundaries are less strong and fluid may burst from it into the subvaginal space. Submaxillary, parotid and lateral pharyngeal spaces are also found above the hyoid level. Pus in either of the last two regions tends to be prevented from pointing on the surface by the vaginal condensation. The lateral pharyngeal space may become infected from the parotid space, tonsil, pharynx or mastoid process. Internal jugular vein thrombosis may occur in neglected cases of deep cervical suppuration. The investigation suggests that infection from the upper neck spaces will reach the jugular sheath without difficulty via the sheaths of that vein's tributaries. Should this be so, it follows that its occurrence or extension is best prevented by ligature, not only of the veins leaving the infected area, but also of their sheaths. The neck is enclosed within a musculo-fascial tube, the vaginal unit, which masks inflammatory lesions and hinders their pointing on the surface. The subvaginal spaces on either side do not communicate. They are deepest beneath the sterno-mastoid muscles and contain many lymph nodes. The three great suprahyoid spaces do not open into them, but they are not very strongly shut off from the retrovisceral compartment. The previsceral spaces, with the exception of the space of Burns, were not fully investigated.

The Thalamus of the Macaque Monkey.

W. E. LE GROS CLARK (*Journal of Anatomy*, October, 1936) describes an experimental investigation into the termination of ascending tracts in the thalamus of the Macaque monkey. Suitably placed lesions were distributed over the spinal cord, the medulla and the mid-brain, and the degenerating fibres traced by the Marchi method. The medial fillet probably ends entirely in the *pars externa* of the ventral nucleus, in which, experiments suggest, there is quite a sharply defined topographical representation of different sensory regions of the body. No sure evidence was found of the actual termination of medial fillet fibres in the *pars arcuata* of the ventral nucleus or in the centre median nucleus, whilst the lateral nucleus was in all experiments quite free of Marchi degeneration. The experiments recorded in his paper show that the terminal fibres of the medial fillet in the thalamus are distributed over that part of the ventral nucleus whose cells undergo complete atrophy after lesions confined to the post-central gyrus. The inference drawn from this experimental evidence is that the afferent impulses conveyed by the medial fillet are projected onto this cortical area. The great majority of the spino-thalamic fibres end in the *pars externa* of the ventral nucleus, the site of the termination corresponding closely with that of the medial fillet fibres. No degenerating fibres were found to enter any other thalamic nucleus, though it is suggested that the Marchi technique may not be adequate to decide such a point. The author emphasizes the fact that spino-thalamic fibres end preponderatingly in the same thalamic nucleus which receives the termination of the medial fillet, because of the generally accepted thesis that these two tracts serve to convey afferent impulses of different categories. The efferent cerebellar fibres in the *brachium conjunctivum* passing to the thalamus were found to end almost entirely in the dorsal and rostral parts of the *pars externa* of the ventral nucleus. This area of termination corresponded in a very striking way to the area of complete cell atrophy which follows cortical lesions involving the precentral gyrus. Trigeminal fibres arising in the spinal nucleus were found to end in the medio-ventral part of the *pars externa* of the ventral nucleus. Some may end in the parafascicular nucleus and the nuclei of the medial medullary lamina through which they course. There is no evidence that any terminated in the centre median, arcuate or dorso-medial nuclei. Unfortunately in no case was a lesion placed in the main and medullary sensory nuclei of the fifth nerve.

Intra-Epidermal Nerve Endings.

As the result of an anatomical and experimental investigation into certain forms of cutaneous sensation, H. H. Woollard (*Journal of Anatomy*, October, 1936) discusses the generally accepted statement, recently challenged by D. Waterston, that the epidermis is the seat of pain and the dermis the seat of the sensation of touch. He comes to the conclusion that the epidermis is not in any way the site of pain. Nerve plexuses regarded as affording the anatomical basis for pain were discovered in a sub-epidermal position. The author agrees with Waterston that the epidermis functions as an organ of touch, but only in an accessory capacity and not exclusively, as is stressed by the latter.

Cranial Venous Sinuses.

BARNES WOODHALL (*Archives of Surgery*, August, 1936) briefly reviews the literature relating to variations of the cranial venous sinuses in the region of the *torcula Herophili*. In 100 preparations studied he found: (*a*) right-sided predominance in 39% and left-sided predominance in 13%; (*b*) major disproportion between the lateral sinuses in 24%; (*c*) inadequate cross-circulation at the torcular in from 10% to 15%; (*d*) a gross occipital abnormality in from 4% to 6%; (*e*) absence of one lateral sinus in 4%; and (*f*) direct relationship between the volume of the sinuses and the markings of the skull. He draws attention to the part played by such abnormalities in the validity of the Queckenstedt test in the diagnosis of lateral sinus thrombosis.

Innervation of the Periodontal Membrane.

IN an investigation into the innervation of the periodontal membrane, W. Lewinsky and D. Stewart (*Journal of Anatomy*, October, 1936) found that the nerve fibres of the membrane came from the apical region of the tooth. These fibres communicated with each other and were reinforced in their course by fasciculi which entered the membrane through foramina in the alveolar process. As they proceeded towards the gingival margin individual fibres left the main bundles at intervals and, after a short course, divided dichotomously into small branches. When traced to terminations, they were seen to break up into fine arborizations and no fusion of the terminal fibres with each other could be detected. Many of these fibres ended in small rounded bodies. Some of these endings appeared to be in direct contact with the cells of the periodontal membrane, but such an observation, the authors think, is of doubtful significance. They were unable to trace nerve fibres into the cementum and dentine of the tooth. The recurrent nerve loops described by Kadanoff and Bradlaw were observed. Bradlaw's terminal coils and the end rings of van der Sprenkel were not seen.

Blood Cysts in Cardiac Valves.

THE various opinions expressed as to the origin of blood cysts in human cardiac valves are discussed by D. R. Dow and W. F. Harper (*Journal of Anatomy*, October, 1936). Their examination of these cysts in the heart valves of infants up to six months old supports the view of Haushalter and Thiry that they originate from blood in the heart cavity which has been pressed into a valve cusp from the ventricular aspect. The cysts occurred near the free edge of avascular valves. The tricuspid valve was most frequently affected.

Hypophyseal Variations in the Guinea-Pig.

C. S. CHADWICK (*American Journal of Anatomy*, November, 1936) has shown that there are cyclic variations in the percentage of cell types in the anterior hypophysis of the guinea-pig. These variations may be correlated with the periods of the œstrous cycle. There is a high level of chromophile cell types during the follicular phase of the cycle and a low level during the luetin phase. The basophile cells are high in relative percentage in proœstrus and undergo degranulation early in the œstrous period. The eosinophile cells reach their peak in early œstrus and undergo degranulation in late œstrus and metœstrus.

Congresses.

THE AUSTRALIAN AND NEW ZEALAND ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE twenty-third meeting of the Australian and New Zealand Association for the Advancement of Science was held at Auckland from January 12 to 19, 1937, under the presidency of Sir David Rivett, K.C.M.G., M.A., D.Sc., Deputy Chairman and Chief Executive Officer of the Commonwealth Council for Scientific and Industrial Research.

The Sections.

The bulk of the scientific proceedings of the Association's congress took the form of sectional meetings, with presentation of addresses and papers and the customary discussions. Many scientific problems were discussed at joint meetings of two or more sections; different aspects could thus be adequately presented and reviewed. The sections constituting the congress were: A, Mathematics, Physics and Astronomy; B, Chemistry; C, Geology; D, Zoology; E, History; F, Anthropology; G, Economics, Statistics and Social Sciences; H, Engineering and Architecture; I, Medical Science and National Health; J, Education, Psychology and Philosophy; K, Agriculture and Forestry; L, Veterinary Science; M, Botany; N, Physiology; O, Pharmaceutical Science; P, Geography and Oceanography.

Election of Officers.

The meeting of the General Council of the Association preliminary to the congress was held at the Arts Building, University College, Auckland, on January 12. Sir Douglas Mawson, O.B.E., F.R.S., D.Sc., B.E., of the University of Adelaide, was in the chair. Professor Ernest Scott, Professor of History in the University of Melbourne, was chosen President-Elect for the next biennial congress, which will be held at Canberra in January, 1939. The Canberra congress marks the fiftieth year of the Association's existence. The Council accepted the invitation of the South Australian Government to hold a meeting in Adelaide in August, 1940.

Dr. A. B. Walkom was reelected Honorary General Secretary of the Association.

Messages of congratulation on their birthdays were sent to Sir David Masson, a past president, who had reached his seventy-ninth year, and to Professor Walter Howchin, of Adelaide, who was ninety-two years of age.

The Mueller Medal.

Professor E. W. Skeats, Professor of Geology in the University of Melbourne, was awarded the Mueller Medal for his work on dolomitization, coral reef geology and petrology of igneous rocks in Australia.

The Medical Sciences.

As indicated in the report which follows, a great number of the subjects discussed were of medical interest and application. The more definitely medical work was conducted in the meetings of Section I. The officers of the section were: President, Dr. A. R. Southwood, of Adelaide; Vice-Presidents, Dr. A. H. Baldwin (School of Public Health and Tropical Medicine, Sydney), Sir Raphael Cilento (Director-General of Health for Queensland), Professor D. W. Carmalt Jones (Professor of Medicine, Otago University), Dr. J. H. L. Cumpston (Director-General of Health, Commonwealth Department of Health), Dr. M. H. Watt (Director-General of Health, Wellington). Dr. J. E. Caughey, of Auckland, was the Secretary of the Medical Section.

Reception of Delegates.

The Mayor of Auckland, Mr. Ernest Davis, gave a civic reception to the members at the Town Hall, Auckland, on the morning of January 12. In the afternoon a garden party was held at the home of Mr. and Mrs. F. Crossley Mappin. A garden party was also held at Government House, Auckland, on January 19.

Inaugural Meeting and President's Address.

The inaugural meeting was held at the Auckland Town Hall on the night of January 12. The Governor-General of the Dominion of New Zealand, Viscount Galway, a patron of the Association, welcomed the visitors to New Zealand. He stressed the fact that economic progress depended very largely on scientific discoveries, and commended the work of the Association.

Sir David Rivett, the incoming President of the Association, delivered his address on "The Scientific Estate". The title of the address referred to the estate or field which science was called upon to explore and to cultivate. Science, he said, described knowledge which had been acquired and tested in accordance with a severe mental discipline, by means of a technique not always easily acquired. The scientific investigator needed complete intellectual freedom, as well as the means to undertake his work. In some places these desiderata were not obtainable. A university had a prime duty to create knowledge and to promote the better understanding of what had already been garnered. Lack of facilities for creative work on the part of the teacher led to equal barrenness in his teaching activities.

Sir David Rivett expressed satisfaction that the Commonwealth Government had offered to provide £30,000 a year for five years for scientific research. He urged the closer cooperation between official bodies conducting scientific research under the ægis of the Governments of Australia and New Zealand. He discussed the bearing of scientific research on the problems of primary industry. Through ignorance of the relations between natural vegetation and the soils of huge areas of the Commonwealth, the capital of that vegetation asset had been exploited, and tragic soil erosion now presented a serious problem which no one knew how to handle. The prevention and cure of animal and plant diseases, the conquest of weeds and insect pests, the difficulties of satisfactorily transporting foodstuffs overseas—all such problems were of vital importance to both dominions, and required an immense amount of further investigation. He cited especially the problems of the wool industry. He considered that the dominions were fully justified in their efforts to establish and extend secondary industries. A bureau of standards, a national physical laboratory, was a real need. Facilities for physical and chemical research would be a great national asset, whatever the direct economic value might be. Sir David Rivett advocated the extension of the work of science over the whole social field, promoting the common good. The new "problem of leisure" would be readily solved if more people devoted themselves to the study of science, philosophy, and the arts for their refining and strengthening effects upon mankind.

Public Lectures.

During the meeting public lectures were delivered by Dr. D. F. Martyn, on "Beyond the Stratosphere", and by Professor H. C. Richards, on "Geophysical Methods of Prospecting for Ores and Oil".

Dr. Martyn discussed some important discoveries made as the result of research work at the University of Sydney. It had been established that there was a very hot layer of air, above 1,000° C., at a height of about 120 miles above the ground. This research had also led to the discovery of a relationship between the state of electrification of the air sixty miles above the ground and the weather conditions at the ground. It had been previously thought that the stratosphere was a cold, still region, not subject to weather changes. Conditions for investigating this subject were more favourable in the southern hemisphere than in the northern; weather conditions were simpler in the south, owing to the greater proportion of ocean surface. Australia and New Zealand should assist their scientists to examine further these phenomena, which were of economic as well as scientific importance.

The lecture by Professor Richards described the locating of ores or oil by geophysical methods. The physical properties made use of were those of magnetism, density, elasticity and electrical conductivity, giving four types of geophysical prospecting—magnetic, gravimetric, seismic and electrical. The electrical and seismic methods appeared to offer greatest possibilities, and the future of geophysics was immense.

Liversidge Memorial Lecture.

The Liversidge Memorial Lecture was delivered by Mr. T. Rigg, Director of the Cawthron Institute, Nelson, before the Chemistry Section. The lecture constituted one of a very important series of papers on chemical deficiencies of soils. Mr. Rigg said that New Zealand workers had made a signal contribution to world knowledge with their investigations into the importance of such elements as boron, copper, manganese, iodine, zinc and cobalt, in both plant and animal nutrition. In Australia an ailment of oats known as "grey speck" had been overcome by the use of manganese salts. Animal health research had received a new impetus from the discovery that copper was essential for hæmoglobin formation, and that on some soils supplements of iodine were beneficial in overcoming stock ailments and goitre trouble in man. Ailments of the "bush sickness" type in sheep had been overcome by the use of cobalt salts. "Internal cork" or "corky pit" of apples grown on certain Nelson soils was found due to a boron deficiency, and the trouble responded to the use of borax added to the soil in proper amount. Borax also controlled "brown heart" of swedes and turnips.

In a subsequent paper, Professor J. A. Prescott, of the Waite Research Institute, Adelaide, said that the use of soil surveys afforded one of the soundest scientific methods for promoting the efficient use of land for agriculture and forestry.

Dr. L. I. Grange dealt with the geological aspect of mineral deficiencies in New Zealand soils. The chemical aspects were discussed, and the effects on fruit, vegetable and pasture plants, and on the nutrition of sheep and cattle were the subjects of special papers by workers from both dominions.

Mr. H. R. Marston, of the Commonwealth Nutrition Laboratory, contributed a paper on "Mineral Deficiency in Sheep". He stated that enzootic marasmus and "coast disease" and "bush sickness" were similar diseases. Cobalt deficiency was an important factor in their ætiology. He reviewed the general characters of the diseases. Hæmosiderosis of the liver, to the amount of thirty times the normal iron content, was found in the diseased sheep. The use of salts of cobalt and of iron overcame the severe wasting and anæmia. Cobalt seemed an essential element for ruminant metabolism.

Problems of the Upper Atmosphere.

An account of the advances made in the last ten years in the scientific investigation of the propagation of radio waves was given by Professor J. P. V. Madsen, of the University of Sydney, in his presidential address to Section A. It had been shown that radio communication was effected under certain conditions by a sky ray in addition to a normal ground ray. The Kennelly-Heaviside layer, one hundred kilometres above the earth, possessed reflecting properties; ionization of the constituents of the layer by the ultra-violet portion of the sun spectrum was probably responsible. The ionosphere extended to greater heights. A further layer at two hundred kilometres was named the Appleton layer. Recently it had been shown that reflecting regions also existed at much lower heights, down to fifteen kilometres above the earth. There were daily and seasonal changes in the conditions of these layers. Sunspot activity also affected the layers. Research on the effects of the radio wave on the ionosphere was giving ideas as to the constituents, pressure and temperature of the ionized regions.

Other papers presented dealt with the exploration of the atmosphere. The ionized layers surrounded the earth "like the skin of an onion" and bent back toward the ground the radio waves which encountered them. The meteorologist as well as the radio worker was concerned with these discoveries. Mr. G. H. Munro, of Sydney, described his method of estimating the number of collisions between electrons and molecules in the ionosphere. Dr. D. Brown described the work done at Auckland University College, and indicated a possible correlation between the ionosphere and wind velocity. Mr. G. A. Peddie described the observations made at Wellington during the eclipse of the sun in December, 1936. The visual eclipse was accompanied by a marked eclipse in the ionosphere, and there was little doubt but that the agent causing all the ionization in the atmosphere was the ultra-violet radiation from the sun.

The Dominant Eye.

Mr. R. Fraser referred to the handicap under which many people laboured through lack of coordination between visual function and manual activity. Many persons who used the right hand for writing and other work possessed a dominant left eye. He considered it a mistake to assume that every child should be made to become right-handed. There should be freedom of choice in the use of the hands up to the stage when the eye dominance could be determined. In children who were naturally left-handed, the use of the right hand was likely to reduce manual efficiency. Mr. F. G. Hayes-Towns also presented a paper on the relation between dominant hand and eye.

Climate and Comfort.

In a paper by Dr. W. A. Macky, of the Meteorological Department of New Zealand, the climatic conditions of various places in the Dominion were discussed. Basing his conclusions on the kata-thermometer, Dr. Macky found that the most bracing climate in New Zealand was enjoyed by Wellington. It excelled that at the Hermitage, Mount Cook. The invigorating effect of a climate and its pleasantness or otherwise depended in temperate regions upon the ability of the air to remove heat from the body. Wellington air was 40% more cooling than that of Auckland.

Dr. E. Kidson discussed the relationship between climate and the incidence of illness. Those kinds of weather which produced the most sickness were the least agreeable from the comfort standpoint and were principally wet and cold weather. The variation of the incidence of illness throughout the year resembled that of rainfall. Evaluation of the total effect of different climatic conditions was a very difficult matter. It did not necessarily follow that health would be better if the climate were drier and more equable.

Dr. Kidson also referred to two common deficiencies in the equipment of many modern buildings, namely, in heating and artificial lighting. A more scientific management of heating appliances in homes, work buildings and especially schools would be conducive to health and to more efficient work. The general adoption of central heating would do away with much illness, provided the temperature was not kept at too high a level. An intense research into the best means of heating buildings of various classes and of maintaining desirable conditions as regards humidity and ventilation would be of the utmost value.

Progress in Organic Chemistry.

Professor A. K. Macbeth, in the presidential address to the Chemistry Section, referred to the lack of papers on pure research being contributed; most of the material was on applied work. He discussed the work being done in the Adelaide University Chemistry School on the chemistry of hydroxynaphthaquinone colouring matters occurring as plant products. The chemistry of naturally occurring products related to phenanthrene, and the biochemical relationships of sterols and bile acids were reviewed. The knowledge of the organic chemistry of the sex hormones had shown remarkable progress. The carcinogenic activity of the various phenanthrene hydrocarbons was reviewed, and the bearing of the œstrogenic hormones on the cancer problem.

The Denaturation of Blood Pigment.

Mr. H. F. Holden presented a paper describing a study he had made, employing a method of determination based on ultra-violet spectrophotometry in the region of the Soret band of the amounts of blood pigment, denatured by hydrochloric acid, that could be reconverted to the native form. When ox oxyhæmoglobin was denatured, 70% could be recovered as methæmoglobin, while if methæmoglobin or hæmoglobin were denatured, over 90% could be so recovered. The difference was attributed to an irreversible oxidative denaturation of a part of the globin by part of the oxygen of the oxyhæmoglobin when this substance was converted into acid hæmatin.

Australian Butterflies.

The presidential address to Section D was delivered by Dr. G. A. Waterhouse on "The Taxonomy and Biology of Certain Australian Butterflies". Dr. Waterhouse had seen in the British Museum of Natural History in London in 1936 some of the earliest butterflies caught in the South Pacific by Sir Joseph Banks during the first voyage of Captain Cook in 1769 and 1770. The specimens were in a state of good preservation and were tended with the greatest care. Some other butterflies in the museum had been preserved since 1700. In his proposed publication on the subject Dr. Waterhouse said that the classification of Australian butterflies would be as advanced as in any part of the world. The bulk of the address related to the habits, life histories and distribution of different butterflies in the South Pacific. It was suggested that the cause of similar coloration of species of different families of butterflies in certain islands was due to the mineral constituents of the soils. The metals were taken up by food plants, and so to the larvæ.

Fishery Control in New Zealand.

A valuable paper on "The Biological Aspect of Some New Zealand Fisheries Problems" was contributed by Mr. A. E. Hefford. The history of the world's fisheries showed that exploitation had greatly outpaced conservation. The trade in snapper exported from Auckland since 1930 showed a fivefold increase; it was doubtful if such exploitation could continue without causing a shortage. Snapper had so far well maintained their preponderance in the fish fauna of north New Zealand. It was possible that through ignorance of vital statistics of the fish population the opportunity for saving flounder stocks from depletion in the Hauraki Gulf and other waters of the Dominion had already been missed. There was also evidence of depletion of blue cod and hapuku. Conservation was important, but administrators hesitated to interfere on inadequate information. For all commercially important species there should be: first, a statistical record of abstractions; second, a biometrical survey of vital statistics of existing stocks; and third, biological data regarding reproduction, growth and migration.

Black and White Culture Contacts.

Mr. A. S. Kenyon, in the presidential address to the Anthropology Section, discussed "Black and White Culture Contacts on the Australian Continent". He referred to the enterprise of the University of Adelaide in promoting investigations of the Australian aborigines. Records of early meetings of Europeans with the blacks provided one continuous story of admiration for the good qualities of the aborigines. Later, there were attempts to evangelize or to civilize them, and the results were always the same: glowing reports of initial achievement, sanguine forecasts of successful conversions and uplifting, and then gradual fading out of existence of the tribe or people being dealt with. The problem of dealing with Australia's vanishing yet highly admirable and desirable race called for the action of men experienced in governing subordinate races and of men trained in the psychology of primitive peoples.

Native Art and Education.

Suggestions as to how the interests of native races could be revived in their own arts were made in a paper by Mr. F. E. Williams, Government Anthropologist in the Territory of Papua. Instead of training the native solely along industrial lines, attention should be given to training for application to village needs, not only utilitarian, but æsthetic. The artistic tendencies of native people should be encouraged, not repressed. Some misguided educators inculcated in the natives a contempt for their own native cultures, instead of fostering proper pride. The cultivation of indigenous arts and crafts was eminently desirable.

Professor A. P. Elkin, of the University of Sydney, also contributed a paper on the education of native races. In most cases the failure of primitive peoples to adjust themselves to the impact of another culture had been due to the speed with which the new culture had advanced on them. This had been true of the Maoris, the Australian aborigines, and the Red Indians in America. The rate of change in cultures should be made slowly, and the native should not be so treated that he developed a feeling of inferiority. While elements of the new culture were taught, the old must be saved from contempt.

Tasmanian Aborigines.

The origin of the Tasmanian aborigines and the method of their arrival in Tasmania were the subject of an interesting paper read by Dr. W. E. L. H. Crowther, of Hobart. He referred to Professor Wood Jones's book, "Tasmania's Vanished Race". His conclusion that the Tasmanian aborigines travelled not by any overland route, but by a long canoe voyage, from New Caledonia or some other island, across the South Pacific and the Tasman Sea, had given rise to considerable controversy and was not accepted by all interested in the matter. It was with great diffidence that he (Dr. Crowther) joined issue with Dr. Wood Jones on this important question; but he urged the consideration of some vital factors which might modify the conclusions drawn. *Homo tasmaniensis* must have entered Tasmania, if he came by land, before the last ice age, or by a land bridge, parts of which still remained as the islands of Bass Strait. Geological and other evidence was scanty. Although evidence of occupation of the islands by the Tasmanians on their passage had not yet been found, it was possible that a systematic search might provide it. It had to be regarded as not unlikely that man had come to Tasmania by such a land route, a part of which had since subsided, leaving him and his contemporary fauna isolated on the island.

If the Tasmanian came not by land bridge, but by sea, two methods were to be considered: a long sea voyage, deliberately planned, possibly as a canoe load of castaways; or as a slow extension of migration in a southerly direction along the Australian coast, with permanent or semi-permanent settlements *en route*, and finally by short canoe voyages from island to island across Bass Strait to Tasmania. After a detailed consideration of the status of the Tasmanians as navigators, the types of their canoes and a comparison of the Melanesian and Polynesian canoe voyages and migrations, Dr. Crowther discussed climatic and oceanic conditions likely to be encountered on a long direct canoe migration from New Caledonia or other island of the Pacific. After weighing up the various data, Dr. Crowther put forward the thesis that the early Tasmanians had reached the island by a slow infiltration from the Melanesian or other Pacific islands, southward along the Australian coast, and finally by canoe voyage across Bass Strait, possibly breaking this part of their journey at one or other of the straits islands.

Australia's Empty Lands.

The presidential address of Dr. C. T. Madigan, delivered to the Section of Geography and Oceanography, was the subject of outstanding interest. Far from there being vast areas of valuable unused lands in Australia, development had in many places gone too far. The great sand ridge deserts of Australia constituted 485,000 square miles of useless country, one-sixth of the area of the continent. Adjacent country, without sand ridges, but equally useless, brought the total arid area up to 848,500 square miles—over 28% of the total area. Practically the whole of the remaining country had been occupied and was being made use of to some extent.

The arid area of nearly a million square miles had to be completely disregarded as far as possible population increase was concerned. Of the total area of Australia, 57% (or 1,690,000 square miles) was suitable for pastoral purposes only, while but 15% (436,000 square miles) was suitable for agriculture and closer settlement. If the closer settlement area were populated to the density of European standards, there would be sixty millions of people in Australia. The increase might be made by peasants and agricultural workers or by factory workers. The development of secondary industries seemed to Dr. Madigan to be the desirable line of progress. No sudden increase of population was possible. Indeed, the arrival of one million immigrants would produce chaos. The population of sixty millions could be expected, perhaps, in about two hundred years' time.

For and Against Migration.

In a paper read before the Economics Section, Professor A. H. Tocker, Professor of Economics at Canterbury University College, said there was a real need for a more scientific and practical approach to the whole problem of immigration and population. New Zealand could support many more people. It was probable that, relative to the numbers and needs of the present population, the country was over-capitalized in many respects, especially in State enterprises, such as railways, roads, hydroelectric developments and buildings. In most cases these assets were capable of serving a much larger population. Many of the amenities required a large demand for their economic production, and he considered a greater population was desirable. Moreover, he considered that New Zealand's internal economy could be so organized as to permit the country to absorb many immigrants for many years and to achieve a rising standard of general welfare in the process. But present conditions at home and abroad, the states of nationalism, restriction and rigidity, were not conducive to free migration, which required flexibility, freedom and expansion, both internally and externally. New Zealand's absorptive capacity was potentially great and might well be used to the advantage of the country and of the present inhabitants, but for the reasons adduced it was actually low and appeared likely to remain low.

Mr. H. Burton, of the University of Melbourne, reviewed the events in Australian immigration schemes and gave a warning of the dangers that might arise from a resumption of assisted immigration to the Commonwealth. Up to 1891 assisted immigration had been useful, but its resumption before the War was largely, it seemed, an attempt to justify the "White Australia" policy. The results of "State-aided Empire settlement" were disappointing all round. Australia had incurred extensive losses on land settlement schemes and a heavy burden of dead-weight debt. There were indications that the renewal of assisted immigration was imminent, this time the main argument being the need for increasing the population for defence purposes. Mr. Burton thought that an increase in population in the near future would be quite useless for defence and would provide only a few more targets for enemy bombers.

The Importance of Town Planning.

Important factors in town planning in New Zealand were explained in a paper by Mr. E. V. Blake. The subdivision of land for urban building blocks, and the laws and regulations under which surveyors were required to work in this connexion were reviewed. The survey systems adopted by governments stamped the pattern of development of towns. In many cities, Auckland for example, there was likely to be a shortage of playing fields as districts became more intensively settled. Local authorities should realize that playing fields were a valuable part of a town's amenities. From the health standpoint, adequate open spaces, parks and playing fields were essential, and in town subdivisions proper provision should be made.

The Status of Mind.

Professor Alexander Gunn, of the University of Melbourne, gave the presidential address to Section J. The study of mind, he said, was common to both philosophy and psychology. The psychologist emphasized the analytic study of mind content as knowing, feeling and willing. The philosopher faced the problem of mind in relation to the external world, to the phenomena of life and evolution. The question raised by creative evolution was whether environment could be adapted to human ideas. Was not intelligence used to change and shape environment? In so far as that was so, mind became a factor in evolution. Mind was known more immediately than matter. Really, man knew little of either that was profound, and less still of the relationship between them. Did man's vaunted reason or intelligence control his passions, or did he use his intelligence as a clever "box" from which he picked reasons or excuses for what his passions urged?

Psycho-analysis was not the whole story. It shared the field with *"Gestalt"*, behaviourism, introspection, the purposive psychology of McDougall and the French and British school of medical psychology represented by Janet and the late Dr. Rivers.

Psychology naturally led to ethics, the judgement of good or bad, beauty or ugliness. Man's ethical decisions were mental acts. The whole practical aim of education was to train minds, not only in knowing and observing, but in choosing, and in knowing what to choose. Professor Gunn stressed the value of happy childhood. There should be no stifling of the natural impulses of the healthy young mind for truth, justice, beauty and love.

Practical Applications of Psychology.

Mr. K. W. R. Glasgow, of Dunedin, discussed "The Prognostic Value of Intelligence Tests with Regard to Secondary School Pupils". A large scale investigation had shown that a half-hour intelligence test gave almost as useful an idea of the relative abilities of pupils in a class as could the school examinations. The results of the tests showed a remarkable agreement with the marks assigned by headmasters in the examinations. Boys tended to have slightly higher intelligence quotients than girls, but girls tended to work rather better. A combination of primary school marks and the intelligence tests gave a definitely more satisfactory basis for classifying entrants to secondary schools than was given by the usual entrance examination.

The value of applied psychology to industry was emphasized in a paper by Mr. H. F. Benning, of Sydney. Many large business undertakings employed personnel officers. Their duties were to advise the management regarding policies as they affected employees; to assist in the grading, transfer, promotion and appointment of staff; to control welfare and recreation activities; to conduct investigations into personality disorders of employees; to plan job analysis, classification and salary standardization schemes; to investigate such matters as tardiness, sick leave, vacations and special leave.

Progress in Veterinary Science.

Dr. J. A. Gilruth, of Melbourne, who delivered the presidential address before the Section of Veterinary Science, gave a brief review of a number of animal diseases known in other parts of the world and in these Dominions, and of research work in Australia and New Zealand which had shown valuable results. The bacterial causes of infectious necrotic hepatitis (black disease) of sheep, and of entero-toxæmia (pulpy kidney) had been discovered, and an effective vaccine had been produced for each condition. Contagious bovine pleuro-pneumonia, previously thought to be due to a virus, was shown to be due to an organism visible in certain stages, but sometimes filter-passing. Bull had prepared a vaccine for two types of *Bacillus botulinus* infections. The investigations of Bull and Dickinson into contagious lymphadenitis were also discussed. Maggot infestation (blowfly strike) had been found to be due in most cases to the green fly (*Lucillia cuprina*); the value of diboric dressings and of removal of the heavy breech folds had been shown. Dr. Gilruth also discussed the veterinary applications of the recent work on mineral deficiency in soils, especially with regard to iron, cobalt and nickel.

Dr. C. S. M. Hopkirk, of the Veterinary Laboratory, Wallaceville, read a paper on "Calcium and Phosphorus Deficiencies in New Zealand". The increasing use of phosphatic manures and of bone meal licks had almost banished osteofibrosis and Waihi disease. Various cattle diseases and sheep diseases had been found to be due to soil deficiencies. Zinc poisoning had been found to disturb the normal calcification of the long bones of pigs.

The Flora of Arid Regions.

Mr. Edwin Cheel, in the presidential address to the Botany Section, stated that considerable areas of country in Australia were arid and semi-sterile so far as plant life was concerned. How, he asked, could the economic well-being of those in agricultural, horticultural and pastoral pursuits be best promoted without excessive interference with the remaining remnants of indigenous flora of Australia? Could the vast areas of arid lands be improved by the judicious planting of suitable plants of economic importance? Botanical research, and especially the study of native plants, with a view to obtaining maximum yields of vegetation, were most important matters.

Heart Disease and National Welfare.

Dr. A. R. Southwood, of Adelaide, delivered the presidential address to the Section of Medical Science and National Health. The subject was "Heart Disease and National Welfare". The address will be published in full in a subsequent issue.

The following resolution was passed by the section:

> That the Australian and New Zealand Association for the Advancement of Science, recognizing the influence of diseases of the heart on national welfare, recommend to the governments of the Commonwealth of Australia and the Dominion of New Zealand: (i) that research into this subject be encouraged and promoted by the National Health and Medical Research Council and similar official bodies; and (ii) that representations be made through the appropriate channels for the amendment of the International List of Causes of Death, so that diseases of the heart and circulation may be officially recorded on an ætiological basis.

At the meeting of the General Council of the Association, held on the concluding day of the meeting, the resolution was adopted.

Advances in Medicine.

Professor D. W. Carmalt Jones, of Dunedin, read a paper on "Major Advances in Medicine in the Twentieth Century". He limited his remarks to the advances in treatment. The underlying principles in the use of digitalis for cardiac disturbances and the value of quinidine were dealt with. The general nature of immunity processes and their relationship to the clinical aspects of tuberculosis were discussed. Asthma and other manifestations of allergy had been the subject of much study, and a clearer understanding of such conditions had been gained. The striking advances in knowledge of the function of the various ductless glands, and the therapeutic applications gradually being evolved, were epoch-making, while the modern story of pernicious anæmia was a veritable miracle.

Dr. F. G. Morgan, of Melbourne, complimented Dr. Carmalt Jones on his masterly review.

Dr. J. C. Wadmore, of Whakatane, referred to the value of the pituitrin-adrenaline combination in asthma and other allergic states.

Dr. R. F. Wilson, of Auckland, described the recent work on the division of pleural adhesions in connexion with induced pneumothorax treatment.

Dr. A. R. Southwood commented on the work of Hagedorn with protamine insulinate in the treatment of diabetes, and indicated the limitations that would still exist even if the manufacture of the material became practicable commercially.

The Internal Secretions and the Autonomic System.

Sir C. Stanton Hicks delivered an address before a joint meeting of the Sections of Medical Science and of Physiology on "Non-Specific Therapeutic Response in the Light of Recent Investigations of Hormonal and Vegetative Nervous Regulation". His discussion followed the line elaborated by him in the Listerian Oration delivered before the South Australian Branch of the British Medical Association in May last (*vide* THE MEDICAL JOURNAL OF AUSTRALIA, August 8, 1936).

The interrelation of the glands of internal secretion with each other and with the function of the autonomic nervous system was a subject of growing importance, yet but recently recognized. The assumption of a dualism between nervous and chemical regulation hitherto existing was unnecessary and unwarranted. The fact that the transmission of nervous impulses was hormonal in nature placed neural action in the same relation to effector cells as that of hormone-secreting cells, except for the more directive effect by extension of neurone, providing for close contact and isolated action. Correlation existed with immunity processes and the function of the hypothalamus. Adrenaline secretion was related to an increase in certain cells in the blood, whilst immunization of an animal was impossible without an intact autonomic nervous system. The address embraced a general survey of physiological research into hormones and vitamins and the humoral transmission of nervous impulses. It could be shown that all vital functions were definitely related to the preservation of a constant internal environment.

Endocrine Products in Modern Therapy.

Before a joint meeting of the Sections of Medical Science and of Pharmaceutical Science Dr. B. L. Stanton, of Melbourne, reviewed modern research into the endocrine glands and the therapeutic developments. Modern therapeutic application lagged far in the rear of endocrine research; despite the enormous mass of established facts, few were as yet sufficiently correlated to provide a sound basis for treatment. Recently it had been shown that the autonomic system itself acted through chemical intermediaries. When either a sympathetic or parasympathetic nerve was stimulated, the nervous response ended in the liberation of a chemical substance which was the link between the nerve and its reactive tissue. With sympathetic stimulation, which was kinetic, katabolic and aggressively defensive in its effects, the chemical activator was adrenaline or a closely related substance. With parasympathetic activity, which was static, anabolic and energy-conserving in its effects, the corresponding chemical was acetylcholine.

The isolation of hormones and derived principles in a chemically pure state was the first aim; later, in many cases synthetic preparation followed. Dr. Stanton gave a comprehensive review of the recent discoveries regarding the pituitary gland—the motor of the endocrine system—and its relation to growth and to reproductive function. The work on thyreoid, parathyreoid and adrenal glands was also discussed.

There were great difficulties in assessing the value of hormones in treatment. Too often the diagnosis of glandular deficiency and the estimation of the value of applied hormones had to depend solely on clinical impression. The psychological effects had always to be reckoned with. The commercial products at present available were in many cases unsatisfactory. This was especially so in respect of many new products, where nomenclature, methods of preparation, assay and standardization were still unsettled. Almost every drug house coined new names for its products, and then with pseudo-scientific claims (edited by the commercial manager) treated the medical profession to an intensive post-graduate course on the subject of glandular therapy. Yet, in spite of such difficulties, hormone therapy was gradually being established on a sound foundation and would eventually prove of extreme value.

Dr. A. R. Southwood, on behalf of Section I, congratulated Dr. Stanton on the excellent summary he had provided, and especially emphasized the need for caution on the therapeutic side.

Immunization against Infectious Diseases.

Dr. F. G. Morgan, Director of the Commonwealth Serum Laboratories, Melbourne, spoke on "Active Immunization of Man and the Domestic Animals against Infectious Diseases". After giving a brief historical review of the subject Dr. Morgan referred to the specificity of biological antibodies and the general nature of humoral and tissue immunity. He discussed the methods of conducting immunization campaigns, and the factors likely to limit the extent of campaigns. The essential qualities of antigens, the types of antigen usually employed, the development of the immunity response, and the methods of measuring that response were in turn reviewed. Dr. Morgan illustrated his paper by quoting the results of mass immunization against diphtheria, bubonic plague, Asiatic cholera, tetanus and the "black disease" of sheep.

The Modern Outlook on Influenza.

Dr. F. M. Burnet, of the Walter and Eliza Hall Institute, Melbourne, presented a most illuminating paper on "Immunological Studies of the Influenza Virus", much of it consisting of a report of his own investigations. He gave an account of the experimental methods used for the study of human influenza and of the discoveries that had resulted. It had been shown that the ferret, the mouse and the developing chick embryo were susceptible to the

virus of human influenza. The ferret was not a very convenient animal for experimental work, and the disease was highly contagious in ferrets. The mouse was susceptible to influenza conveyed to it via the ferret, but not directly to the virus from the human subject. The developing egg, up to the twelfth day, when the chorio-allantoic membrane was present, was a highly suitable medium for the culture of influenza virus. The lesions on the inoculated membrane were actually countable.

In the ferret, which was the animal whose reactions to the influenza virus were most similar to those of man, the infection was followed by an immunity to reinfection which lasted about a year. This immunity was associated with, and probably due to, circulating antibodies, which were capable of inactivating the virus. Immunity in the ferret could also be induced by infection with a non-virulent strain developed by long-continued passage of the virus in the developing egg. This strain produced no symptoms and was not contagious from ferret to ferret, but provoked a solid immunity to active virus and a high titre of circulating antibody.

Dr. Burnet discussed the general nature of viruses, especially referring to those of psittacosis, vaccinia, influenza, yellow fever and poliomyelitis.

Conditions in human beings, all of whom had been from time to time exposed to natural infection by influenza virus, were much more complicated than in ferrets. It had been shown that patients with true influenza had little or no antibody at the time of the illness, but developed a considerable titre a few weeks later. Certain people were clinically insusceptible to influenza, yet possessed no trace of specific antibody; in such persons some mechanism other than an immunological one must be postulated. In those who showed antibody, repeated examination over a period of a year revealed a fall in titre. It was probable that as the amount of antibody fell to a certain level characteristic of the individual, he again became susceptible to influenza.

The actual nature of pandemic influenza was an unsolved problem, but recent work on swine influenza had supplied what might be significant clues. In swine the disease was due to a dual infection with a virus and a Pfeiffer-like organism. Work on influenza was in active progress in several laboratories, and in a few years the principal features of its epidemiology should be elucidated. As such knowledge increased, it was likely that effective methods of immunization against influenza would be evolved.

Professor C. E. Hercus, of Dunedin, regarded the paper by Dr. Burnet as most significant, and he commended the author for his painstaking work and for his brilliant discoveries. There were some very peculiar features in the epidemiology of pandemic influenza, and he referred to the three-wave effect noted in the 1918-1919 pandemic.

Modern Knowledge of Vitamins.

Professor J. A. Malcolm, of Dunedin, presented a paper before a joint meeting of Sections I and N on the subject of "Vitamins". He reviewed the matter in historical sequence and discussed the methods of testing and standardizing vitamins. The metabolic processes affecting vitamins after their ingestion had been studied, and it had been shown that the liver possessed great capacity for the storage of some vitamins. The function of vitamins in relation to tissue cells related to the very problem of life itself. The enzyme processes within the cells apparently resulted in oxidation. The relationship of vitamins to disease and the therapeutic problems needed continued investigation.

Anatomy of the Bronchial Tree.

Dr. J. Hardie Neil described his investigations into the detailed anatomy of the bronchial tree. In the work he had the assistance of Dr. W. Gilmour, of the pathological department, and of Dr. F. J. Gwynne in the radiological studies. Dr. Wallace Main and Dr. W. A. Fairclough had also assisted.

Dr. Hardie Neil pointed out the failure of many text-books of anatomy to present a clear conception of the anatomy of the bronchi and their branches. The terminology adopted in comparative anatomy was not wholly applicable to the human structures.

The work of Kramer and Glass on the subject was elaborated and a distinct area of the lower lobe of the lung was shown to have a bronchial supply hitherto unrecorded. The analogues of this feature in other mammalia were illustrated with a series of lantern slides. A satisfactory method of making metallic casts of the bronchial tree, and special methods of lipiodol radiography were described. There was therapeutic benefit sometimes to be derived from instilling into a diseased portion of lung antiseptics in isotonic solution in large amounts, to be absorbed by the lymphatics. A cinema film illustrating the main points of the paper was then shown.

Dangers of Dental Disease.

Dr. R. M. S. Taylor contributed a paper on "Dental Disease in Relation to the Public Health". Although good medical and dental services were available throughout the Dominion of New Zealand, the incidence of dental disease was the highest in the world and the amount of ill-health generally was very great. All dental disease arose primarily from wrong habits of living and eating. Dental disease was sometimes a sign of malnutrition. Adequate dental treatment involved the correction of faulty habits as well as the performance of operative work. Preventive dentistry was a highly important part of preventive medicine; in the practice of these sciences rested the only hope of national health.

The paper gave rise to much discussion. Professor C. E. Hercus eulogized the work of Dr. Taylor, but joined issue with him on several matters. There were many factors contributing to dental and general ill-health, and it was wrong to over-emphasize the food factor. All the factors described as "nurture" were involved. Public health had made great gains, but everybody recognized that there was still more to be done. New Zealand people were as healthy as any in the world. Man should be regarded as a complex organism living in a complex environment; the problem was a biological one of adjustment. Genetic factors played a part. The whole matter called for more research, and dogmatic statements were as yet out of place.

Dr. M. Edelston-Pope, of Sydney, reviewed the statistics of the New South Wales school dental service. In a large series of city children 8% were found with healthy mouths; an additional 6% were made satisfactory by treatment. In a group of country children, 3% were sound at first examination and an additional 6·5% were made sound by treatment.

Dr. A. Thornton Taylor, of Sydney, read a paper entitled "The Family Doctor and Dental Disease".

Studies in Myasthenia Gravis.

Sir Stanton Hicks described the work carried out in Adelaide in seeking knowledge of the chemical and other factors involved in *myasthenia gravis*. He referred to the work of Dr. Mary Walker in England, and of Dr. Wilhelm Feldberg, of Sydney, on the transmission of nerve impulses. It appeared that the myasthenic symptoms were associated either with insufficient production of acetylcholine at the end of the somatic nerves or with an excess production of enterase. It was found that the concentration of enterase in the blood of two myasthenic patients studied by Sir Stanton Hicks and his associates was greatly in excess of the normal. Moreover, the enterase activity was shown to have increased as the day went on. The strong prostigmine solution, injected hypodermically, had proved of some value in treatment.

A National Food Policy.

Dr. E. B. Gunson, of Auckland, considered there was need for a national food policy, with coordination of agricultural and health interests. He discussed tables of morbidity and mortality as indices of the state of the public health, and concluded that much illness in the community was associated with nutritional inadequacies. He adopted the commonly accepted division of foodstuffs into two groups: the energy-producing and the protective. He held that the inadequate consumption of protective foodstuffs was sufficient explanation of the high incidence of minor disabilities among school children and of the fact that the

highest rate of hospital admissions occurred in young adults of fifteen to twenty-five years. It was also significant that 25% of hospital admissions were of people suffering from digestive troubles.

Dr. Gunson submitted that the Dominion should adopt all the recommendations of the League of Nations Nutrition Committee on the subject. The giving of milk to school children was a feature now being adopted throughout the Dominion, and he considered it a valuable measure; it would probably cost the government almost £1,000,000 *per annum*, and was worth it. He especially eulogized the work of Sir John Orr, of Aberdeen, who had stated that the greater part of ill-health now being borne might be eliminated in a single generation if it were possible to ensure that every person had an adequate diet.

National Health Insurance.

A discussion on "National Health Insurance" was briefly introduced by Dr. A. R. Southwood, President of Section I. He regarded the subject of extreme importance. The actual value of research work and the discoveries arising therefrom were really dependent on the extent to which the community shared in the benefits. The problems of hospital provision and of the organization of medical services were matters of great concern to the whole community. Dr. Southwood reviewed the history of health insurance schemes in various countries; the introduction of some type of scheme seemed imminent in New Zealand, and the discussion was therefore most opportune.

Dr. J. P. S. Jamieson, of Nelson, presented a valuable review of the subject. In 1883, when Bismarck introduced the scheme in Germany, the primary consideration was an economic one and the provision of medical treatment was a secondary matter. In 1911 the panel system was adopted in England; so far British Columbia was the only overseas part of the Empire to adopt a scheme. The schemes of different countries varied in the method of contributing, in the groups of persons insured, in the amounts of cash benefits available, and in the scope of medical treatment provided. The method of remuneration of the doctors also varied: sometimes it was on a capitation basis (as in England), sometimes as a salary, and sometimes for items of services rendered.

Dr. Jamieson pointed out that, although cash benefits had been the primary consideration, medical benefits had now assumed the major place. The British scheme was inquired into by a Royal Commission in 1924; and the report issued in 1928 stated that the whole scheme had fully justified itself, was on the whole successful in operation, and was of advantage to the workers.

Conditions in New Zealand were not altogether comparable with those of England. The problems were different. There was little or no difficulty in wage-earners in New Zealand getting adequate medical aid. The general medical practice in New Zealand and in Australia was of high grade; the doctor carried out the bulk of treatment personally and made it his own responsibility. Dr. Jamieson feared that the introduction into New Zealand of a health insurance scheme similar to the English one would lead to a deterioration of the excellent medical services which the people at the present time enjoyed.

Dr. S. L. Ludbrook, of Auckland, considered it an important duty of the State to care for the health of its people. National health insurance had begun in Germany, England and elsewhere as a poverty-relieving measure, and there had really been no obvious effect on community health. Some scheme for the domiciliary treatment of the sick poor was needed in New Zealand; in other respects there was no evidence that the people were likely to lack medical care under the present system.

Professor C. E. Hercus said that health insurance had been mooted in New Zealand since 1935. It was necessary to view the matter from a community standpoint, as a scientific problem in organization for community welfare. In arranging insurance against sickness the psychological difficulty presented itself. It was a totally different matter from insuring against fire for instance. Was it possible, he asked, to propound a scheme putting a premium of some sort on the maintenance of good health? It was necessary, too, to make hospital practice more effective as a disease-preventing agent, and the proper organization of a public health nursing service was required.

Dr. Southwood apologized for the absence of Sir Henry Newland, who was to have read a paper on insurance problems. Sir Henry had given much study to the matter, but regretted being unable to attend the meeting.

In summarizing the main points of the discussion, Dr. Southwood said it was first necessary to inquire just how far the State should be responsible for the health of its people and to what degree health was a personal responsibility. They should try to inculcate a sense of shame in relation to illness and a sense of pride in good health. That people should appear to take pleasure in recounting over the tea-cups the details of their various illnesses and operations was a very sad thing. The education of the general public, and especially the children in schools, in the principles of general hygiene had to be continually hammered at. National health insurance, having begun as a poverty-relieving measure and then become a huge therapeutic scheme, could best justify its continued existence by becoming an active agent in health education, the basis of disease prevention.

Thermal Adjustment of Primitive Man.

Before a combined meeting of Sections I and N, Sir Stanton Hicks delivered an address on "The Thermal Adjustment of Naked Primitive Man to his Environmental Conditions, as shown by a Study of the Australian Aboriginal". He described investigations made by himself and co-workers on aborigines in Central Australia. Estimations of basal metabolic rates and many anthropological measurements were made. A study of the von Pirquet-Pelidisi showed that, although European subjects never gave a figure over 90, the aborigines always were over 100. The investigations into oxygen consumption showed that the native did not use more oxygen than the European. Studies of surface areas, surface temperatures and the specific dynamic effect of foodstuffs were also described. It was interesting that the aboriginal, living in the primitive state, did not contract pneumonia; if, however, he became "civilized" and wore clothes, he became even more susceptible to pneumonia than the white man. The native living under primitive conditions appeared to possess some power of control over his skin circulation. Sir Stanton, in pointing out the possible clinical applications of his work, stressed the fact that pure research was often more productive of results than research applied to some definite "practical" end.

Sir Stanton Hicks illustrated his address by means of an excellent series of lantern slides.

Hydatid Disease.

A joint discussion was arranged for Sections I and L on "Hydatid Disease: Research and Prevention". Sir Louis Barnett, Emeritus Professor of Surgery of the University of Otago, described the work of the Department of Hydatid Research at the Medical School, Dunedin. Hydatid disease was more prevalent than the available statistics indicated. In the past forty-five years 563 deaths in New Zealand had been attributed to hydatid disease. It was commoner in the South Island than in the North. The liver infestation of slaughtered beasts gave a good indication of the extent to which stock were affected. From 40% to 55% (the figure differed in different districts) of ox and sheep livers of beasts slaughtered at abattoirs were affected. There were thirty million sheep in New Zealand; about twelve million were killed annually for food.

Sir Louis Barnett reviewed the life history of the hydatid parasite and showed how the infection was spread. Educational measures had been tried for some time and were giving some results, but he felt that more stringent legal enactments were desirable. Dog-owners should be compelled to administer arecolin hydrobromide or some other effective anthelmintic every two or three months; this applied especially to dogs in country districts, where the oppor-

tunity for infection was so great. The feeding of raw offal to pigs should be a punishable offence.

Mr. W. C. Barry, Director of the Live Stock Division, New Zealand Department of Agriculture, opened the discussion. There was no doubt, he said, that the distribution of hydatids among sheep, cattle and pigs in New Zealand was very great. In one district it had been shown that 70% of grown beasts were affected. He discussed the legal requirements relating to the conduct of slaughterhouses. If farmers were made to suffer some economic loss for producing infected stock they would probably devote more attention to preventive measures.

Other speakers considered shock tactics were indicated. Educational measures had not given sufficiently good results, and economic pressure alone would achieve the objective. A fine of threepence levied for every infected sheep sent to market would get something done. Such a levy would result in the collection of £50,000 (according to Professor Hercus) in New Zealand in the first year of its imposition. This would be a useful fund for medical research work.

The Classification of Proteins.

Mr. H. F. Holden, of the Walter and Eliza Hall Institute, read a paper, suggesting a revision in the method of classifying proteins. The chief modifications proposed in the American scheme were five in number. The coloured proteins need not remain a separate class, but might be placed according to their protein portion. The albumin group should include "pseudo-globulin", globin and hæmoglobin. Globulins should include only the crystalline group and hæmocyanins; serum "eu-globulin" should be recognized as a mixture of "pseudo-globulin" and a meta-protein. The meta-protein group should include glutelins, histones, phospho-proteins, mucins and stroma proteins. Proteoses should include protamines and mucoids.

Atmospheric Carbon Dioxide.

Dr. R. H. Makgill read a paper on "Atmospheric Carbonic Acid: Its Value to Life", describing investigations he had made under the direction of the late Professor J. S. Haldane into variations of the carbonic acid content of the atmosphere. He described the Haldane apparatus for quick determinations of carbon dioxide, enabling the demonstration of variations too transient to be recorded by the more elaborate and accurate methods. The gravimetric process, for instance, required the use of a very large volume of air and occupied some hours for each analysis. Experiments were described illustrating the influence of organic activity in the soil and the effects of this process on such circumstances as rainfall, air currents, temperature and sunlight. The parts played by the respiratory activity of plants and by photo-synthesis, the distributing action of ocean and streams, and the importance to plant life of an adequate supply of carbonic acid were also discussed.

Keeping Properties of Eusol.

Mr. H. Finnemore and colleagues presented a paper before Section O on the keeping properties of eusol. A summer period in Queensland had been chosen for the tests. Even in one week the strength of the eusol had fallen greatly, especially if in clear glass bottles. Even in winter conditions and in amber bottles the solution was found to lose some strength within a fortnight.

Pharmaceutical Subjects.

Many other papers on pharmaceutical subjects were presented before Section O.

Mr. E. M. Watson described investigations made into the essential oil content of Western Australian eucalypts. Few species contained sufficient oil to warrant commercial exploitation. The oils varied in nature, and in some there was little of the essential constituent of medicinal eucalyptus oils, cineol or eucalyptol. The application of the oils to the flotation treatment of mineral ores was referred to.

Mr. A. R. Penfold and Mr. F. R. Morison, of the Sydney Technological Museum, directed attention to the unique value of the essential oil of *Melaleuca alternifolia* (an Australian ti-tree) in surgical and dental practice. The oil appeared to be non-poisonous and non-irritating, and had the property of being able to penetrate pus layers. It had been shown that the germicidal power of the oil was actually increased in the presence of organic matter.

Mr. Edward Nye read a paper on artificial colouring matters, with regard to their constancy.

The proposed revision of the Australian Pharmaceutical Formulary in 1940 was also discussed by Section O.

Vitamin B Complex.

A review of the work done on the properties of the constituent members of the vitamin *B* complex was given by Mr. W. D. Leech. At least six members of the group had been studied by various workers and a vast amount of information had been accumulated. In some instances the clear differentiation of the subsidiary factors had not yet been attained.

British Medical Association News.

VICTORIAN BRANCH NEWS.

AT the request of the Council of the Victorian Branch of the British Medical Association there is published hereunder a short account of some matters that the Council wishes to bring under the notice of members of the Branch. The Victorian Branch will from time to time forward for publication similar matter; it is hoped that proceedings of the Council will from time to time be included. Members of the Victorian Branch are asked to watch the columns of the journal for news that will be of particular interest to them.

THE attention of members of the Victorian Branch is called to the following provisions of the *Midwives Act* 1928 and the regulations thereunder:

Section 27. (1) In case of an emergency as defined in the regulations a midwife shall (where no medical practitioner engaged by or on behalf of the patient is in attendance) call in to her assistance a medical practitioner.

(2) The midwife shall report forthwith to the Board each case of emergency in which she has called in a medical practitioner to her assistance stating the nature of the emergenecy and the name of the medical practitioner.

(3) The medical practitioner so called in may recover his fee from the patient or her husband or other person liable under the *Maintenance Act* 1928 for her confinement expenses.

Provided that where in any case it is shown to the satisfaction of the Board that the patient or her husband is unable to pay such fee the Board shall on the application of such medical practitioner pay him a fee according to the prescribed scale and such fee shall cover one subsequent visit with due allowance for mileage.

(4) It shall be a condition of the payment of such fee by the Board that the medical practitioner so called in shall state in his application to the Board the nature of the emergency.

Emergencies are defined in the third schedule:

1. *Pregnancy.* In the case of a pregnant woman—

(*a*) when abortion or miscarriage threatens or occurs;
(*b*) if the patient is a dwarf or deformed;
(*c*) when there is excessive loss of blood;
(*d*) when there is any abnormality or complication such as:

excessive sickness;
puffiness of hands or face;
fits or convulsions;
dangerous varicose veins;
purulent discharge;
sores on the genitals;
persistent headaches;
dimness of vision;
illness or abnormality or stillbirth in a previous pregnancy.

2. *Labour.* In the case of a woman in labour at or near term when there is any abnormality or complication such as:

fits or convulsions;
a purulent discharge;
sores on the genitals;
a malpresentation;
presentation other than normal;
where no presentation can be made out;
when there is excessive bleeding;
where, two hours after the birth of the child, the placenta and membranes have not been completely expelled;
in cases of rupture of the perineum, or of other injuries of the soft parts;
in cases where labour has been prolonged more than 24 hours;
where general condition of the patient is unsatisfactory.

3. *Lying-in.* In the case of a lying-in woman, when there is any abnormality or complication, such as:

fits or convulsions;
abdominal swellings and tenderness;
offensive lochia;
rigor, with raised temperature;
puerperal pyrexia;
unusual swelling of the breasts with local tenderness or pain;
secondary *post-partum* hæmorrhage.
white leg.

4. *General.* In all cases in which a woman during pregnancy, labour, or lying-in appears to be dying or dead.

5. *The Child.* In the case of the child, when there is any abnormality or complication, including:

injuries during birth;
any malformation or deformity in a child;
dangerous feebleness;
inflammation of, or discharges from, the eyes, however slight;
serious skin eruptions;
inflammation about, or hæmorrhage from, the navel;
premature birth endangering the child's life.

The fourth schedule sets out the "Scale of Fees Payable to Practitioners for Attending Cases of Emergency".

The scale of fees payable by the Board to medical practitioners for attending cases of emergency as defined in Part III shall be as set out below:

Scale of Fees.

	£	s.	d.
(1) Visit and advice (pregnancy, labour, lying-in)	0	10	6
(2) Abortion-curettage	3	3	0
(3) Delivery	1	1	0
(4) Delivery after version or destructive operation	2	2	0
(5) Perineal repair, where called in after delivery	1	1	0
(6) Complete perineorrhaphy	2	2	0
(7) Expression of placenta or post-partum hæmorrhage—			
(*a*) where no intra-uterine manipulation is required	0	10	6
(*b*) where intra-uterine manipulation is required	1	1	0
(8) Lying-in-curettage	2	2	0
(9) Anæsthetist's fee (if special anæsthetist required)	1	1	0

"By day" to which the above fees refer, shall mean that the practitioner has been called from his residence between the hours of 8 a.m. and 8 p.m.

"By night" for which 10s. 6d. in addition to the above fees may be claimed, shall mean that the practitioner has been called from his residence between the hours of 8 p.m. and 8 a.m.

Mileage rates, chargeable one way only, and to be reckoned from the practitioner's residence—

For every mile or portion thereof after the first mile, up to three miles:
By day, 2s. 6d. per mile.
By night, 5s. per mile.
For every mile or portion thereof after three miles:
By day, 5s. per mile.
By night, 7s. 6d. per mile.

Claims under this schedule shall be lodged with the Board within three months from the date of attendance.

NOMINATIONS AND ELECTIONS.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Hatcher, Frank, M.B., B.S., 1935 (Univ. Sydney), Wyadra Avenue, North Manly.
Joseph, Maurice Roy, M.B., B.S., 1936 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

The undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Altmann, Stella Cecilia Adelaide, M.B., B.S., 1932 (Univ. Melbourne), 10, Charnwood Road, St. Kilda, S.2.
Cahill, Francis Joseph, M.B., B.S., 1935 (Univ. Melbourne), 125, Wellington Street, Flemington, W.1.
Cust, Norman Albert Austin, M.B., B.S., 1933 (Univ. Melbourne), Children's Hospital, Carlton, N.3.
Glassford, Eric MacAllan Gordon, M.B., B.S., 1915 (Univ. Melbourne), 2, Collins Street, Melbourne, C.1.
Macaulay, Frederick Charles, M.B., B.S., 1936 (Univ. Melbourne), Royal Melbourne Hospital, Melbourne, C.1.
Matthews, Ian Jamilton Killough, M.B., B.S., 1934 (Univ. Melbourne), Merino.
McLean, Trevor Alexander, M.B., B.S., 1936 (Univ. Melbourne), Geelong Hospital, Geelong.
Riddell, Rees James, M.B., B.S., 1935 (Univ. Melbourne), 302, Mont Albert Road, Surrey Hills, E.10.
Seward, David Norman Livingstone, M.B., B.S., 1936 (Univ. Melbourne), Geelong Hospital, Geelong.
Synan, Dorothy Florence, M.B., B.S., 1931 (Univ. Melbourne), 252, Buckley Street, Essendon, W.5.
Smith, Hubert Reynolds, M.B., B.S., 1936 (Univ. Melbourne), 36, Powlett Street, East Melbourne, C.2.
Taft, Boyard Israel, M.B., B.S., 1935 (Univ. Melbourne), 10, Margaret Street, Canterbury, E.7.

Correspondence.

"FUNNY TURNS."

SIR: In his published paper, "Funny Turns", in the journal of January 9, Dr. S. O. Cowen mentions, under the treatment of migraine, the possible endocrine factor in its ætiology. I should like to submit the following for what it is worth.

A married woman of sixty-three had had attacks of migraine for forty years. Of late they had been a weekly occurrence, incapacitating her for a day each time. She had been treated on many occasions and by many physicians, and had had "Luminal", bromides, dietetic restrictions *et cetera* without benefit.

She gave the history that while pregnant she had always been free of the trouble. On September 1 I gave her

100 units of "Antuitrin S", repeated it next day, gave her 75 units on September 3, 7 and 17, and on October 20. She has not had attack in the last four months. This case would appear to have had an endocrine basis.

Yours, etc.,

J. C. ENGLISH.

Gunnedah,
New South Wales,
January 14, 1937.

DEMONSTRATION AT "MOORFIELDS", LONDON.

SIR: It is probable that during the time of the coronation some old students of Moorfields from overseas will be in London. We are therefore arranging a short series of demonstrations that they may like to attend, and the following programme is being arranged:

1. Exhibition of ophthalmoscopic conditions, Tuesday, May 4, at 5.30 p.m.
2. Exhibition of slit lamp cases, Thursday, May 6, at 5.30 p.m.
3. Operation demonstrations: (*a*) cataract, (*b*) glaucoma, (*c*) detachment, (*d*) squint. A selection of the above on the mornings of Monday, May 3, Wednesday, May 5, Friday, May 7.
4. Orthoptics, Tuesday, May 4, at 10 a.m.
5. Pathological exhibitions, Wednesday, May 5, at 5.30 p.m.

We will be pleased to welcome any of our friends, and it would make arrangements easier if they would be so good as to send us notice of their intention to attend the course.

Yours, etc.,

CHARLES GOULDEN,
Dean of the Medical School,
Royal London Ophthalmic Hospital.

January 13, 1937.

MALARIA.

SIR: In the journal for January 9 Sir James Barrett writes: "If malaria gets a grip of Australia people will be sorry for themselves. For reasons set out in other communications I think it unlikely, but not impossible."

There can be little doubt that the area of distribution of malaria was far greater in this country a hundred years ago than it is at the present day. The earliest records of the Moreton Bay settlement show that "fever and ague" was common in convict patients. Sixty years ago it was not unusual for young men going out onto the newly opened stations in central Queensland to contract malaria. The miners in the early days of Croydon and the Palmer suffered from the disease almost to a man. The earliest settlers on cattle stations in North Queensland looked on "fever and ague" as part of the price paid by pioneers. Mr. F. L. Jardine, Police Magistrate at Somerset, writing to the Commissioner of Police, Brisbane, on May 1, 1872, states: "Also beg to inform you that during the month there has been an unusual amount of sickness among the men, chiefly low fever and fever and ague, the native troopers suffering equally as much as the whites."

Towards the end of the century malaria disappeared entirely from most districts, and today can be said to be confined (as far as Queensland is concerned) to the Cape York Peninsula as far south as Cairns, and to the islands of the Torres Strait. In 1934 malaria assumed epidemic proportions in this area, at least 2,000 cases coming under my notice alone.

The paradox of the disease disappearing from districts as the population increased is at first rather puzzling. The real reason is undoubtedly the advent of large herds of cattle, which not only drove out the aboriginal hosts of malaria, but caused the surface water to dry up and disturbed the breeding places of the mosquito.

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However, there is little fear of further spread of the disease. Under existing conditions, the chance of any increase in the population of tropical Queensland north of the sugar belt is so remote that this generation of health officers can sleep on in peace.

Yours, etc.,

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Might I add that some care is essential with the repeated dosage of acriflavine 1 in 1,500 emulsion or drops. I have known a severe binocular keratitis follow upon its usage over a period of a week at two to four hourly intervals, with permanent depreciation of vision. It is a valuable drug in the treatment, but is capable of producing very irritating reactions.

Yours, etc.,

GRANVILLE WADDY.

227, Macquarie Street,
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January 18, 1937.

CONGENITAL TUMOUR OF THE UPPER JAW.

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Yours, etc.,

JOHN DWYER.

25, Port Road,
Bowden,
South Australia,
January 18, 1937.

2. *Labour.* In the case of a woman in labour at or near term when there is any abnormality or complication such as:

fits or convulsions;
a purulent discharge;
sores on the genitals;
a malpresentation;
presentation other than normal;
where no presentation can be made out;
when there is excessive bleeding;
where, two hours after the birth of the child, the placenta and membranes have not been completely expelled;
in cases of rupture of the perineum, or of other injuries of the soft parts;
in cases where labour has been prolonged more than 24 hours;
where general condition of the patient is unsatisfactory.

3. *Lying-in.* In the case of a lying-in woman, when there is any abnormality or complication, such as:

fits or convulsions;
abdominal swellings and tenderness;
offensive lochia;
rigor, with raised temperature;
puerperal pyrexia;
unusual swelling of the breasts with local tenderness or pain;
secondary *post-partum* hæmorrhage.
white leg.

4. *General.* In all cases in which a woman during pregnancy, labour, or lying-in appears to be dying or dead.

5. *The Child.* In the case of the child, when there is any abnormality or complication, including:

injuries during birth;
any malformation or deformity in a child;
dangerous feebleness;
inflammation of, or discharges from, the eyes, however slight;
serious skin eruptions;
inflammation about, or hæmorrhage from, the navel;
premature birth endangering the child's life.

The fourth schedule sets out the "Scale of Fees Payable to Practitioners for Attending Cases of Emergency".

The scale of fees payable by the Board to medical practitioners for attending cases of emergency as defined in Part III shall be as set out below:

Scale of Fees.

	£	s.	d.
(1) Visit and advice (pregnancy, labour, lying-in)	0	10	6
(2) Abortion-curettage	3	3	0
(3) Delivery	1	1	0
(4) Delivery after version or destructive operation	2	2	0
(5) Perineal repair, where called in after delivery	1	1	0
(6) Complete perineorrhaphy	2	2	0
(7) Expression of placenta or post-partum hæmorrhage—			
(*a*) where no intra-uterine manipulation is required	0	10	6
(*b*) where intra-uterine manipulation is required	1	1	0
(8) Lying-in-curettage	2	2	0
(9) Anæsthetist's fee (if special anæsthetist required)	1	1	0

"By day" to which the above fees refer, shall mean that the practitioner has been called from his residence between the hours of 8 a.m. and 8 p.m.

"By night" for which 10s. 6d. in addition to the above fees may be claimed, shall mean that the practitioner has been called from his residence between the hours of 8 p.m. and 8 a.m.

Mileage rates, chargeable one way only, and to be reckoned from the practitioner's residence—

For every mile or portion thereof after the first mile, up to three miles:
By day, 2s. 6d. per mile.
By night, 5s. per mile.
For every mile or portion thereof after three miles:
By day, 5s. per mile.
By night, 7s. 6d. per mile.

Claims under this schedule shall be lodged with the Board within three months from the date of attendance.

NOMINATIONS AND ELECTIONS.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Hatcher, Frank, M.B., B.S., 1935 (Univ. Sydney), Wyadra Avenue, North Manly.
Joseph, Maurice Roy, M.B., B.S., 1936 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

The undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Altmann, Stella Cecilia Adelaide, M.B., B.S., 1932 (Univ. Melbourne), 10, Charnwood Road, St. Kilda, S.2.
Cahill, Francis Joseph, M.B., B.S., 1935 (Univ. Melbourne), 125, Wellington Street, Flemington, W.1.
Cust, Norman Albert Austin, M.B., B.S., 1933 (Univ. Melbourne), Children's Hospital, Carlton, N.3.
Glassford, Eric MacAllan Gordon, M.B., B.S., 1915 (Univ. Melbourne), 2, Collins Street, Melbourne, C.1.
Macaulay, Frederick Charles, M.B., B.S., 1936 (Univ. Melbourne), Royal Melbourne Hospital, Melbourne, C.1.
Matthews, Ian Jamilton Killough, M.B., B.S., 1934 (Univ. Melbourne), Merino.
McLean, Trevor Alexander, M.B., B.S., 1936 (Univ. Melbourne), Geelong Hospital, Geelong.
Riddell, Rees James, M.B., B.S., 1935 (Univ. Melbourne), 302, Mont Albert Road, Surrey Hills, E.10.
Seward, David Norman Livingstone, M.B., B.S., 1936 (Univ. Melbourne), Geelong Hospital, Geelong.
Synan, Dorothy Florence, M.B., B.S., 1931 (Univ. Melbourne), 252, Buckley Street, Essendon, W.5.
Smith, Hubert Reynolds, M.B., B.S., 1936 (Univ. Melbourne), 36, Powlett Street, East Melbourne, C.2.
Taft, Boyard Israel, M.B., B.S., 1935 (Univ. Melbourne), 10, Margaret Street, Canterbury, E.7.

Correspondence.

"FUNNY TURNS."

SIR: In his published paper, "Funny Turns", in the journal of January 9, Dr. S. O. Cowen mentions, under the treatment of migraine, the possible endocrine factor in its ætiology. I should like to submit the following for what it is worth.

A married woman of sixty-three had had attacks of migraine for forty years. Of late they had been a weekly occurrence, incapacitating her for a day each time. She had been treated on many occasions and by many physicians, and had had "Luminal", bromides, dietetic restrictions *et cetera* without benefit.

She gave the history that while pregnant she had always been free of the trouble. On September 1 I gave her

100 units of "Antuitrin S", repeated it next day, gave her 75 units on September 3, 7 and 17, and on October 20. She has not had attack in the last four months. This case would appear to have had an endocrine basis.

Yours, etc.,

J. C. ENGLISH.

Gunnedah,
New South Wales,
January 14, 1937.

DEMONSTRATION AT "MOORFIELDS", LONDON.

SIR: It is probable that during the time of the coronation some old students of Moorfields from overseas will be in London. We are therefore arranging a short series of demonstrations that they may like to attend, and the following programme is being arranged:

1. Exhibition of ophthalmoscopic conditions, Tuesday, May 4, at 5.30 p.m.
2. Exhibition of slit lamp cases, Thursday, May 6, at 5.30 p.m.
3. Operation demonstrations: (*a*) cataract, (*b*) glaucoma, (*c*) detachment, (*d*) squint. A selection of the above on the mornings of Monday, May 3, Wednesday, May 5, Friday, May 7.
4. Orthoptics, Tuesday, May 4, at 10 a.m.
5. Pathological exhibitions, Wednesday, May 5, at 5.30 p.m.

We will be pleased to welcome any of our friends, and it would make arrangements easier if they would be so good as to send us notice of their intention to attend the course.

Yours, etc.,

CHARLES GOULDEN,
Dean of the Medical School,
Royal London Ophthalmic Hospital.

January 13, 1937.

MALARIA.

SIR: In the journal for January 9 Sir James Barrett writes: "If malaria gets a grip of Australia people will be sorry for themselves. For reasons set out in other communications I think it unlikely, but not impossible."

There can be little doubt that the area of distribution of malaria was far greater in this country a hundred years ago than it is at the present day. The earliest records of the Moreton Bay settlement show that "fever and ague" was common in convict patients. Sixty years ago it was not unusual for young men going out onto the newly opened stations in central Queensland to contract malaria. The miners in the early days of Croydon and the Palmer suffered from the disease almost to a man. The earliest settlers on cattle stations in North Queensland looked on "fever and ague" as part of the price paid by pioneers. Mr. F. L. Jardine, Police Magistrate at Somerset, writing to the Commissioner of Police, Brisbane, on May 1, 1872, states: "Also beg to inform you that during the month there has been an unusual amount of sickness among the men, chiefly low fever and fever and ague, the native troopers suffering equally as much as the whites."

Towards the end of the century malaria disappeared entirely from most districts, and today can be said to be confined (as far as Queensland is concerned) to the Cape York Peninsula as far south as Cairns, and to the islands of the Torres Strait. In 1934 malaria assumed epidemic proportions in this area, at least 2,000 cases coming under my notice alone.

The paradox of the disease disappearing from districts as the population increased is at first rather puzzling. The real reason is undoubtedly the advent of large herds of cattle, which not only drove out the aboriginal hosts of malaria, but caused the surface water to dry up and disturbed the breeding places of the mosquito.

As to the prevalence of other tropical diseases in Australia, one cannot do better than follow the lead of Professor Low, who pointed out at a meeting in Melbourne (September, 1935) that malaria, filariasis, yaws, dengue, hookworm, sprue, ulcerative granuloma and tropical skin diseases were endemic in Australia.

From the point of view of a northerner, nothing but a blind faith in the perfection of a southern conception of conditions in the tropics could give rise to a belief that this country is free from tropical diseases. No one will deny that these diseases are endemic in New Guinea, and so far I have yet to hear why 100 miles of sea that is freely spaced by inhabited islands will act as a barrier to any particular disease.

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Graduates of Sydney University over the last ten years or more will recall that I have hammered into them, as students, this fact and virtue, and pleaded with them to regard milk as the sheet anchor of treatment in the infection. It is hard to understand why various authors and clinicians hesitate to recommend and use the treatment. It is a standing rule at Royal Prince Alfred Hospital and the Royal Hospital for Women, that any case of gonorrhœal *ophthalmia neonatorum* receives an injection of five cubic centimetres of sterilized milk on admission.

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25, Port Road,
Bowden,
South Australia,
January 18, 1937.

AN ILLNESS RESEMBLING EPIDEMIC PLEURODYNIA.

SIR: During the past six weeks there has occurred in this district an illness which appears to conform in every respect to epidemic pleurodynia. The cases occurred in the town first, and mostly among children, but lately the disease has spread throughout the district and adults are being affected almost as frequently as children.

The main symptoms are sudden onset with acute pain in the chest, shallow rapid respirations, fever to 100° or 101° F., and slight anorexia. The disease in children at times is alarming, but it is very transient and the child is better in two or three days, or even less.

As the disease, epidemic pleurodynia, has not been reported outside America (as far as I can discover from the literature), I would be interested to know if it is occurring elsewhere in Australia at present, and, further, if it has been reported previously in this country.

Yours, etc.,

K. McK. DOIG.

Colac,
Victoria,
January 19, 1937.

PYRETOTHERAPY AND HODGKIN'S DISEASE.

SIR: In *The British Medical Journal*, November 14, 1936, Dr. Dawson Henry, of Wellington, New Zealand, reports a case of recovery from Hodgkin's disease following a moderately severe attack of scarlet fever.

The cure of a chronic complaint by a febrile attack has been recognized for ages and has been known as heterotherapy or pyretotherapy.

It was the late Emile Legrain who, in the last chapter of his work *"Maladies des Pays Chauds"*, published by Maloine, of Paris, in 1913, gave a most interesting account of various chronic maladies which were greatly benefited or even cured by an attack of quartan malarial fever; and I suggest that it might be worth while trying inoculation of the parasite in cases of this disease.

Yours, etc.,

I. MORRIS ROE.

Victory Chambers,
Queen Street,
Brisbane,
January 19, 1937.

A CORRECTION.

SIR: I wish to draw the attention of all members of the British Medical Association (New South Wales Branch) to an error which appeared in the circular sent out on February 2, 1937. Would they please read "Western" for "Western Suburbs" Medical Association in that circular.

I regret any inconvenience which may have been caused to members of either of the Associations concerned, and advise that the error will be corrected in a subsequent circular.

Yours, etc.,

C. H. JAEDE.

4, Robey Street,
Mascot,
February 5, 1937.

Obituary.

HERMAN FERMOR LAWRENCE.

WE are indebted to Dr. A. L. Kenny for the following appreciation of the late Dr. Herman Fermor Lawrence:

Herman Fermor Lawrence, of Lister House, 63, Collins Street, Melbourne, died at his home, 203, Walsh Street, South Yarra, on Tuesday, October 20, 1936, after an illness which began suddenly on the previous Friday morning.

Lawrence was born in the resident surgeon's house in the Melbourne Hospital in 1863, and used to boast playfully that he was the oldest surviving "resident" of that hospital. At the time, his father, Dr. Octavius Lawrence, was the resident surgeon of the hospital. Dr. Octavius's parents were pastoralists in Tasmania, and in due course Dr. Octavius inherited a large pastoral estate there. His wife, with unusual prudence, frequently impressed upon Dr. O. Lawrence the wisdom of studying for a profession and taking out a degree even without any intention of practising a profession. He began at Cambridge and completed his course in Melbourne, being the first Doctor of Medicine in the University of Melbourne.

As it happened, very bad years came for the pastoralists in Tasmania, and it proved to be a very fortunate thing for Dr. O. Lawrence that he had graduated in medicine. He practised in Fitzroy, Victoria, for many years until he died at a ripe old age, beyond eighty years.

In his youth Herman Lawrence had a magnificent physique and was a splendid athlete, a good footballer and one of the best pair oarsmen of his day on the river. Although for a time he attended Wesley College, Melbourne, and the Geelong Grammar School, the major portion of his education was given to him at Scotch College, Melbourne.

He entered the medical school in the University of Melbourne in 1881, and before graduating went to the Edinburgh Medical School. On June 7, 1889, he was registered by the Medical Board of Victoria as Licentiate and Licentiate in Midwifery of the Royal College of Physicians and Royal College of Surgeons of Edinburgh, 1888; Licentiate of the Faculty of Physicians and Surgeons of Glasgow, 1888; Member of the Royal College of Physicians, 1889.

When Saint Vincent's Hospital was founded in Melbourne in 1893, Lawrence was a member of the original staff, the remaining survivors of which are A. L. Kenny and J. H. Nelly. Lawrence was appointed as honorary specialist for diseases of the skin. Soon after the announcement of the discovery of the Röntgen rays he became deeply interested in them, and from that time onward was in frequent consultation with Professor (now Sir) Thomas Ranken Lyle, Physicist at the University of Melbourne. Lawrence procured the earliest tubes available and equipped a room for their use in his practice. He had as many as six of these early tubes in action at one time with patients in his consulting room, without any protection for himself, no one being at that time aware of the dangerous ill-effects of these early tubes. He suffered much illness in later years as a result, and lost much of the robustness and apparent vigour of his earlier days. On the discovery of radium and its properties by Madam Curie, he was even more deeply interested in radium than he had been in X rays; he devoted himself for the rest of his life to their intensive study and carried out continuous series of exhaustive experiments as to the properties and correct use of radium.

He gained a world-wide reputation as a result of his studies and experiments. He wrote two books, published numerous papers on radium, and received repeated queries and requests for papers from radiological journals throughout the world. Few of his colleagues knew how great his reputation was abroad.

By means of a very prolonged series of experiments with radium upon silkworms and their ova (in which it is possible to foretell the sex), he was able to change a female ovum to a male and *vice versa*. It was the accumulated experience gained in his experimental work that gave him such facility in calculating the amount of radium and the time period of exposure for each individual patient that would produce the absolute minimum of irritation with the maximum beneficial effect.

Lawrence enjoyed the fullest confidence of his patients and of his brother practitioners. His career was ended full of honour, with a record of a studious life full of endeavour to master his specialty and to acquire the most complete knowledge of the remedial agents that might be employed therein for the benefit of suffering humanity.

A Melbourne University professor wrote: "Lawrence was a good man, the right breed, and one who could be trusted implicitly, both in his profession and outside of it."

In his home life he spoke very little about his school days, his prowess in sport or his great achievements in his specialty, and was most retiring in disposition. To his family it seemed that it was his greatest wish to do something to help in the cure or prevention of cancer. With great regret he found himself in such a state of health that he would not have been accepted for service in the Great War, and by way of compensation did all he possibly could for the returned soldiers. He gave to and received from his family the utmost love and kindness.

May he rest in peace!

A colleague writes:

Dr. Herman Lawrence at Edinburgh was enthusiastic under Dr. Jamieson and continued an enthusiast to the very last.

He worked with Wickham and called on him in Paris in 1907, when he also visited America and astonished them with his X ray work.

For many years Dr. Lawrence was physician to outpatients at the Melbourne Hospital. When the Department of Dermatology was founded, he was appointed dermatologist. He was also consulting dermatologist at the Queen Victoria Hospital.

He founded a school of radiotherapy in Melbourne, through his assistants, which has been most successful and of incalculable benefit to the people.

He was president of the British Association of Dermatology and Syphilology (Victorian Branch) since its inauguration.

He had done a vast amount of work on rodent ulcers and keratoses, which subject he discussed at the congress at Rome in 1912.

He was appointed dermatologist to the Base Hospital, St. Kilda Road, for a period and helped a great deal there while his only son Dennis was at the front in France, severely wounded more than once, but happily surviving his wounds.

He was president of the section of dermatology at congress in Sydney.

He was occupied with a very large practice for many years and had to have assistants with him for the last thirty years, each and all of whom learned much, both in scientific method and also in tactful, kindly management of the sick; and by his example they learned never to decry any brother practitioner.

His attention to the poor was an object lesson in gentlemanly behaviour; the social position of an individual made no difference to his kindly, courteous attention.

His old students always remember the happy picnics he gave once a year, when they gathered in some out of the way part for a good walk and sumptuous repast by the way.

As it was often said, with his kind and courteous nature was always associated a most delightful sense of humour. To people of all ages he could be vastly entertaining in a most solemn way, often disconcerting, but never cruel; and his laughter was infectious even to his "victim".

ALBERT WILBUR BRETHERTON.

We regret to announce the death of Dr. Albert Wilbur Bretherton, which occurred on February 2, 1937, at Epworth Hospital, Melbourne.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

The undermentioned have been registered, pursuant to the provisions of *The Medical Acts, 1925 to 1935*, of Queensland, as duly qualified medical practitioners:

Atkinson, James Arthur Lionel, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Donald, Charles Stewart, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Duck, William Joseph, M.B., B.S., 1929 (Univ. Melbourne), Roma.
Fison, David Charles, M.B., B.S., 1937 (Univ. Sydney), Brisbane.
Jermyn, Cosmo David, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Lawler, Noel Ambrose, M.B., 1922 (Univ. Sydney), Brisbane.
Macfie, Donald, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Monahan, Patrick Joseph, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Morgan, Neville Howard, M.B., B.S., 1935 (Univ. Sydney), Brisbane.
Nicholson, Alphonso Jean Gardner, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Sinclair, Alexander John Maun, M.B., B.S., 1933, M.D., 1936 (Univ. Melbourne), Cloncurry.
Warriner, Sylvester Edwin, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Wherrett, Donald Blanchard, M.B., B.S., 1936 (Univ. Melbourne), Brisbane.
Yeates, James Macrae, M.B., 1935 (Univ. Sydney), Toowoomba.

VICTORIA.

The undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1928, of Victoria, as duly qualified medical practitioners:

Wagenmaker, Wilhelmina Johanna, M.B., Ch.B., 1935 (Edinburgh).
Harvey, Rupert Francis Leslie Victor, L.R.C.P., L.R.C.S., 1930 (Edinburgh), L.R.F.P.S., 1930 (Glasgow).

PORTRAIT OF PROFESSOR W. A. OSBORNE.

It is the desire of the many friends and old students of Professor W. A. Osborne that his portrait should be painted and presented to him. Arrangements have therefore been made for his portrait to be painted by Mr. McInnes. A subscription list has been opened, and the subscription has been fixed at half a guinea. Readers who wish to be associated with this recognition of Professor Osborne's long services to the University of Melbourne are asked to send their cheque to one of the undersigned, at Medical Society Hall, 426 Albert Street, East Melbourne, C.2.

B. T. Zwar.
H. B. Devine.
Alan Newton.
Victor Hurley.
Sidney Sewell.

Subscriptions from the following have been received, amounting to £55 13s.: Arthur J. Day, J. Newman Morris, R. Douglas Wright, Geo. Scantlebury, J. Grieve, F. Forbes Mackenzie, C. H. Prouse, A. M. Hill, Sir Jas. W. Barrett, F. S. Coombs, W. F. Brownell, Alan J. G. Mackay, Lewis J. Balfour, Professor F. Wood Jones, John R. Heath, L. E. Hurley, E. McDonald, H. H. Jackson, H. H. Martin, Stanley Cochrane, P. R. Slater, Archie S. Anderson, John Anderson, John K. Adey, Geo. Simpson, E. A. Mackay, J. Gowland, H. Robinson, Vera Scantlebury, T. V. Nihill, P. MacCallum, Julian Smith, senr., B. T. Zwar, K. D. Fairley, H. Cairns Lloyd, H. Boyd Graham, Professor Marshall Allan, J. S. Green, F. K. Norris, F. Blois Lawton, F. T. Niall, Eugene Sandner, John P. Sullivan, R. W. Hornabrook, J. Bell Ferguson, M. B. O'Sullivan, L. A. Ivan Maxwell, A. E. Rowden White, E. W. Sutcliffe, Jane S. Greig, Glen A. Knight, G. R. Felstead, D. Roseby, J. H.

Henderson, A. T. Langley, Gerald Weigall, G. A. Birnie, H. Douglas Stephens, Reginald L. Morton, B. R. Hallows, L. P. Wait, A. E. Lincoln, G. A. Penington, R. Tate Sutherland, H. C. Disher, C. H. Mollison, M. H. Mafler, H. N. Featonby, James R. Bell, A. R. Haywood, P. Ward Farmer, Geoffrey Kaye, A. A. Crooks, G. R. Davidson, W. A. Hailes, John H. Shaw, G. E. M. Scott, John R. Searls, E. Jorgensen, S. C. Fitzpatrick, W. E. Donaldson, Hilda A. Greenshields, E. B. Heffernan, Mark Gardner, J. E. Nihill, L. L. Smith, R. H. Strong, J. Ringland Anderson, Rachel H. Gross, Stanley W. Shields, A. C. H. Salter, D. W. Neville, Stella E. Braithwaite, Mathew C. Patrick, Hilda W. Bull, Elizabeth O'Keefe, John I. Hayward, Mary C. De Garis, Hilda E. Kincaid, T. J. Frank, N. V. Youngman, Basil Kilvington, A. E. Coates, I. V. Yoffa, D. L. Yoffa, W. J. Long.

Books Received.

CLIO MEDICA: A SERIES OF PRIMERS ON THE HISTORY OF MEDICINE, edited by E. B. Krumbhaar, M.D. XVIII. Greek Medicine, by F. B. Lund, M.D.; 1936. New York: Paul B. Hoeber. Crown 8vo, pp. 171, with illustrations. Price: $2.00 net.

THE OPERATIONS OF SURGERY. VOLUME II: THE ABDOMEN, by R. P. Rowlands, M.S., F.R.C.S., and P. Turner, B.Sc., M.S., F.R.C.S.; Eighth Edition; 1937. London: J. and A. Churchill Limited. Medium 8vo, pp. 1007, with 514 illustrations, 4 of which are in colour. Price: 36s. net.

WHAT IS WRONG WITH BRITISH DIET? (BEING AN EXPOSITION OF THE FACTORS RESPONSIBLE FOR THE UNDERSIZED JAWS AND APPALLING PREVALENCE OF DENTAL DISEASE AMONG BRITISH PEOPLES), by H. Campbell, M.D.; 1936. London: William Heinemann (Medical Books) Limited. Double foolscap 8vo, pp. 267, with illustrations. Price: 10s. 6d. net.

DIAGNOSIS OF SOME DELUSIONAL INSANITY TYPES IN GENERAL PRACTICE (SCHIZOPHRENIA, DEMENTIA PRÆCOX, PARANOIDAL GROUPS): SUMMARY OF IMPORTANT DIAGNOSTIC POINTS, by E. Hopewell-Ash, M.D.; 1936. London: John Bale, Sons and Danielsson, Limited. Foolscap 8vo, pp. 64. Price: 2s. 6d. net.

Diary for the Month.

FEB. 16.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
FEB. 24.—Victorian Branch, B.M.A.: Council.
FEB. 25.—South Australian Branch, B.M.A.: Branch.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xvi to xix.

ALFRED HOSPITAL, MELBOURNE, VICTORIA: Honorary Officers.

COMMONWEALTH DEPARTMENT OF HEALTH: Medical Officer.

DEPARTMENT OF PUBLIC HEALTH, WESTERN AUSTRALIA: Junior Resident Medical Officer.

ROYAL ALEXANDRA HOSPITAL FOR CHILDREN, SYDNEY, NEW SOUTH WALES: Honorary Officers.

ROYAL HOSPITAL FOR WOMEN, PADDINGTON, NEW SOUTH WALES: Resident Medical Officer.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY, NEW SOUTH WALES: Temporary Honorary Assistant Physician or Honorary Clinical Assistant.

ROYAL SOCIETY OF MEDICINE, LONDON, ENGLAND: Nichols Fellowship.

SAINT VINCENT'S HOSPITAL, MELBOURNE, VICTORIA: Honorary Officers.

THE BENEVOLENT SOCIETY OF NEW SOUTH WALES: Honorary Officers.

THE BRITISH PHOSPHATE COMMISSIONERS, SYDNEY, NEW SOUTH WALES: Assistant Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

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